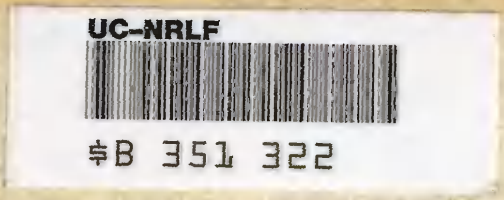

[Cal] Engineer dept

SPECIFICATIONS FOR SAN FRANCISCO STATE BUILDING

CIVIC CENTER

SAN FRANCISCO, CALIFORNIA

FUND CHAPTERS 541—1913 and 618—1919

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BLISS & FAVILLE

ARCHITECTS

STATE OF CALIFORNIA

DEPARTMENT OF ENGINEERING

SACRAMENTO

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Parker & Co. Contract

General Conditions

(1) SPECIAL REQUIREMENTS AND CONDITIONS:

Address of Bids: Bids must be mailed to the State Department of Engineering, Sacramento, and marked "Proposal for (name of branch of work covered by bid), San Francisco State Building, Civic Center, San Francisco, California."

Time of Work: According to provisions of paragraph No. 5, each proposal shall show the number of actual working days as will be required to complete the work for contracts which involve work at the building, or the number of elapsed working days required to complete the delivery for contracts on which the work is complete upon delivery.

Drawings and Specifications: Drawings are marked "San Francisco State Building, Civic Center, San Francisco, California," and numbered, inclusively, 1 to 12, 100 to 107, 1000 to 1009, S-1 to S-18, M-1 to M-20, and E-1 to E-11, which, together with these specifications, cover the complete work called for.

In each Proposal and Instructions to Bidders form, drawing sheets are indicated which cover the work specified. These sheets will be furnished for bidders and the Contractor of that work; however, should a bidder or Contractor require additional sheets, he may have same by applying in proper manner.

The drawings and specifications furnished are intended to cover the complete work necessary to complete the building of the trades involved under the separate contracts and shall be interpreted as such.

Schedule: For such contracts as may be required by the State, Contractors must submit an estimate showing amount of work, by percentage or as directed, which will be completed after ¼, ½ and ¾ of the time of the contract. Same must be itemized and satisfactory to the State and shall be closely followed, allowing only for delays as provided.

(2) DEFINITIONS:

Wherever the following words or combinations of words, or pronouns or variations used in place thereof are used in the specifications, they shall have the following meanings; or references within the limits of their authority:

"State"—State of California, its representative being the "State Department of Engineering," which is the direct authority in full charge of this construction or work, as provided by law.

"Contractor"—Party or parties contracting directly with the State to perform and be responsible for work to be done under these specifications and drawings. Sub-contractors, in relation to the State, are only agents of the Contractor.

"Inspector," "Superintendent"—Representative of the State Department of Engineering at the work.

"Work"—Material and labor therewith, in part or in whole, incorporated or to be incorporated in this construction.

"Called for," "Indicated"—as called for or indicated in specifications or drawings.

"Shown"—as shown on the scale and full size drawings.

"Directed"—as directed by the State.

"Approved," "Proper," "Required," "Satisfactory," "Suitable," "Necessary"—as approved, proper, required, satisfactory, suitable or necessary in the judgment of the State.

(3) BIDS:

Bids must be submitted on the proposal forms supplied by the State. A copy of the advertisement or "Notice to Contractors" shall be attached to, and considered a part of, each bid. Bids shall be in a separate envelope without other matter contained therein.

Each bid shall state a specific sum for completing the whole work as proposed.

To insure fair competition, bids must be based upon the particular materials and workmanship specified. Substitutions are allowed, but only as set forth under "Materials," and only after the contract is let.

The State reserves the right to reject any or all bids and to waive any informality in any bid received.

Plans and specifications must be returned on or before date bids are opened.

(4) BIDDERS' DEPOSITS:

With each bid must be deposited cash, or bidder's bond of an approved surety company, or certified check, payable to the State Engineer, for at least 10% of the bid. After opening bids, all deposits of the unsuccessful bidders will be returned and that of the successful bidder will be retained by the State until the contract is executed.

(5) TIME OF WORK AND DAMAGES:

The State will designate starting date of contract by written notice, when Contractor shall immediately begin and prosecute the work diligently to completion.

Contracts and bonds must be approved by the State Attorney General, according to law, before any work can be commenced.

Each Contractor obligates himself to make his work complete and satisfactory on or before the date as shall be determined by the number of working days stated in the proposal, plus such days as shall be properly allowed, failing which the Contractor hereby agrees to forfeit to the State, not as a penalty, but as liquidated damages which the State would suffer on account of the work not being completed, the sum per day as shall be mutually agreed upon and stated in the contract, but which shall not be less than $5.00 nor more than $25.00, the amount being determined by relation of the work to progress towards completion of the whole building, for each day during which the work is not completed.

The days lost due to strikes, riots, stress of weather, undue interference of other Contractors at the building, or other extraordinary circumstances beyond the control of the Contractor, may be added to the dates for starting or completion of the work, provided the State approves each extension, requested in writing, which shows number of days, and which will only be considered at or before the time of the delay.

(6) WORKING DAYS AND WAGES:

All except Sundays and legal holidays shall be considered as working days. As State laws require, eight hours shall constitute a day's work at not less than $2.00 per day.

(7) CONDITIONS OF SITE:

Before bidding, each Contractor shall have examined the site or have full knowledge of all facilities and difficulties affecting the work which may not be particularly described herein. No variation or allowance from the contract sum will be made because of lack of such examination or knowledge.

(8) CONTRACT AND BONDS:

Successful bidders shall, within 5 days after being notified, enter into a contract with the State for the work bid upon.

Each Contractor shall furnish two bonds, each in the sum of 50% of the contract price, one for the faithful performance of the contract and one covering labor and materials, except that for contracts which are complete on delivery at the building the bond for labor and materials only will be required. Bonds must be acceptable to the State.

The proposal of each bidder must include the cost of bonds furnished from a surety company named on the approved list of the State, as last amended, copy of which accompanies the "Instructions to Bidders."

(9) DRAWINGS AND SPECIFICATIONS:

Figured dimensions on the drawings and the full size details shall govern the work, but work not dimensioned shall be executed as directed and work not particularly shown or specified shall be same as similar parts that are shown or specified.

Any work or materials called for by the drawings and not mentioned in the specifications, or vice versa, is to be furnished in as faithful and thorough a manner as though fully set forth by both.

If deemed proper for any portion of the work on account of developed conditions, permission may be given by the State to deviate from the work as called for, but in such portions only and only on written order. Responsibility for any changes made without order shall rest entirely with the Contractor.

Where not stated otherwise, all work of any branch or trade of a contract necessary to any portion to make reasonably complete, even though not particularly indicated or described, shall be faithfully done as a part of such contract.

The drawings and specifications are one and a part of each other. Should anything be omitted from either which is necessary to a clear understanding of the work, or should any error appear in same or in the work done by others affecting the work of any contract, such Contractor shall apply to the State at once for instructions. If the Contractor proceeds with work affected, without proper instructions, he shall make good any resultant damage or defect.

Intent and interpretation of drawings and specifications shall be decided only by the State.

Where any specific brand, shape, quality or kind of material is called for, which, to properly place or construct, necessitates the use of any special construction or materials not mentioned, the Contractor shall also furnish such special construction or materials, all complete, without extra cost to the State.

Lists, rules and regulations referred to are recognized printed standards used by the trades affected, and are on file at the State Engineer's office for reference if necessary, and shall be considered as one and a part of these specifications within the limits specified. True copies of same must be kept continually at the work.

Drawings and specifications are property of the State and must be returned before final payment or when ordered.

Except where otherwise specifically stated, "General Conditions" apply with equal force to all of the work, including extra work authorized.

(10) DETAILS:

The State may furnish additional scale and full size details to more fully explain the work and same shall be considered part of the contract. Full size drawings shall take precedence in construction over scale drawings.

Any work done by a Contractor before receipt of such details will be done at his own risk and, if not in accordance with same, shall be removed and replaced or adjusted at his expense. Should any of these details be, in the opinion of the Contractor, more elaborate than warranted, written notice thereof must be given the State within five days of receipt of the drawings in question. The State will then consider the claim, and if justified in their opinion, the drawings will be amended or the extra work authorized. Non-receipt of notice as above relieves the State of any claim.

(11) SHOP AND DIAGRAM DRAWINGS:

Except where specifically stated otherwise, Contractors for all steel and iron work, and any other work called for hereafter, shall submit to the State three blue prints of shop or diagram drawings. The approval and corrections of the State will cover the general layout only, and will not relieve the Contractor as to errors, or failure to indicate his work to conform to the drawings of the State and conditions existing in the work. Any errors or omissions shall be made good by the Contractor at his own expense, even though the work be in place.

All such drawings shall be clear and complete and shall show no changes from those of the State, except as properly directed.

(12) WORKMANSHIP AND LABOR:

All work must be done in a thorough and workmanlike manner and shall be first-class in all respects.

Each Contractor shall retain a competent foreman constantly at the construction. All labor must be especially skilled for each kind of work, regardless of the kind and quality of material.

Any person deemed incompetent, careless or disorderly by the State must be promptly discharged upon proper notice and not re-employed.

(13) MATERIALS:

All materials except where otherwise specifically stated shall be new and the very best of its class or kind.

Price, fitness and quality being equal, preference will be given materials manufactured in the State of California; and next, such as have been partly so manufactured.

Special brands or makes are called for as a standard. Others of equal quality may be used if approved by the State.

The fact that the Contractor is permitted to substitute implies no right to substitute articles or materials for those specified, except upon express authority, in writing, of the State. It is agreed that the State shall exercise its own discretion, the Contractor having no recourse if permission is denied by reason of investigation or experience.

Materials which it is desired to substitute must be submitted to the State for test and consideration in ample time, as no claim of delay due to such substitution will be allowed. No substitution will be permitted on account of claimed lack of time for delivery of that specified.

Each Contractor is entirely responsible for delivery of materials at proper times and in sufficient quantities when needed at the work in order not to delay the whole work, and to insure speedy and uninterrupted progress. Same must be stored so as to cause no obstruction to other work or the public and so as to prevent overloading of any portion of the structure, and shall be properly protected from the weather or other damage.

Where it is necessary that materials or articles match or operate with present work, the State can make no allowance if the open market does not afford same, which must be obtained as required.

(14) SAMPLES AND TESTS:

All samples called for, and as specified in case of substitution, shall be submitted to the State for consideration before work is executed. The decision will be expressed in writing. Materials furnished must equal approved samples in every respect. Such samples as are of value after testing or examination will remain the property of the Contractor.

Material or work required or necessary to be tested, unless otherwise stated, shall be tested under supervision of, and as directed by the State, at such points as may be convenient to the Engineering Department. Except where stated otherwise, all costs, other than expenses of State employees and laboratory, shall be borne by Contractor.

The Contractor shall be responsible for delays in the work due to delayed approval of materials or work.

(15) CHANGES:

Work or materials shall be changed, or omitted, or added, only through the standard written "Change Order" of the State, showing amount of deduction or addition. Itemized accounts, showing unit prices and cost of each item, to be used in checking, must be submitted by Contractor with Change Orders. The Contractor agrees to accept additions to or deductions from the contract price based on such unit prices as are specified and submitted, but unit prices for work not specified and submitted shall be mutually agreed upon.

Supplementary contracts shall be executed when changes shall have increased or diminished the contract cost in excess of $500.00.

Any change shall be fully equal and according to the original drawings and specifications for same or similar kind of work as such may be applied without conflict to the conditions required by the order.

(16) REJECTION:

Should any portion of the work be done, or should any material be delivered at the work, which, due to any cause whatsoever, is not in accordance with these drawings and specifications, it will be rejected by the State. The Contractor shall tear out and properly rebuild such portion, or shall remove all such material from the site within 24 hours of rejection, all without damage or loss to the State.

(17) CONDUCT OF THE WORK:

Each Contractor shall lay out his work and be responsible for its correctness. He shall give the work his personal supervision.

Each Contractor shall provide, at his own cost and risk, all tools, machinery, scaffolding, false work, forms and centers and transportation and hauling necessary for the execution of his work, and shall be held responsible for the proper protection of all his work until final acceptance. Although all plant and equipment shall be provided by the Contractors, expense of duplication of scaffolding, hoists, etc., required at about same time and location, shall be avoided and Contractors must co-operate as directed by the State in sharing costs of or renting same. Also see Carpenter Work Specifications.

Contractors shall obtain all necessary measurements from the work and shall check dimensions, levels and construction and see that same are correct, as where work of any contract joins or is on other work, there shall be no discrepancy when the whole work is completed.

In engaging work with other materials, marring or damaging same will not be permitted. Should a Contractor cover up improper work of another, resulting in damage or defects to any of the work, he shall make good the whole work affected.

Contractors must anticipate the relation of all the parts of their work, and of their work with that of others, and shall, at the proper time, furnish and set such anchorage, blocking or bedding as required. Anchorage and blocking necessary in securing the work of each trade shall be considered as a part of same. Contractors of work in which

such anchorage or blocking is set shall assist and co-operate in setting same.

Assistance required by the State in obtaining measurements or information on the work shall be furnished, fully and without cost to the State, by the Contractors, who shall be responsible for accuracy to extent of such assistance.

Complete harmony shall be maintained towards proper progress of the whole work and no Contractor shall interfere with or obstruct the work of others.

If, in the judgment of the State, a Contractor is at any time not conducting his work properly, or if there is unnecessary obstruction or interference, he shall adjust and arrange to carry on his work as directed.

(18) SUB-CONTRACTS:

Assigning interest in, or subletting the whole or any part of a contract, except for furnishing materials, shall only be allowed on written approval by the State of parties thereto, and same shall not become effective until such approval is given.

The State will deal only with a Contractor as heretofore defined, who shall be responsible for the proper furnishing and performance of all work under his specifications and contract. No sub-contractor shall relieve a Contractor of such responsibility.

(19) REGULATIONS AND PROTECTION:

Each Contractor shall conform to all State, Federal or City laws, ordinances and regulations as affecting the work of his contract. He shall give all requisite notices and pay for all connections, public service, permits and inspections for all work of his contract, except where otherwise expressly provided herein.

Contractors shall provide and maintain all proper convenience, guards, railings, lights, warning signs, etc., and take all precautions at all times to avoid injury or damage to persons or property, placing same so as not to damage any property and, upon completion of the work, leave all premises in proper condition.

Whenever work called for affects walks, roads, driveways, streets, highways, or other property, including buildings, Contractors shall provide and maintain all temporary construction necessary for the convenience and protection of the public and property, and shall, at the proper time, replace in perfect condition any property or structure so disturbed.

Contractors shall be collectively and individually responsible for any loss or damage due to failure to provide and maintain construction as above. Also see Carpenter Specification.

No signs or advertising of any description will be permitted in or about the work except by order of the State.

Strict prohibition against committing any nuisance in or about the work must be maintained. If required, a sanitary toilet will be installed by the State. To be properly housed and connected to a sewer and water supply. The Contractors shall keep same continuously clean and in good order.

(20) INSURANCE:

The State carries no insurance and each Contractor shall take out for his work all compensation and fire insurance and shall assume all risk and responsibility for loss of life or accident, or for any loss by fire, or other cause, until the work is finally accepted by the State.

(21) NON-RESPONSIBILITY OF THE STATE:

The State shall not be responsible or accountable for any damage or loss to the work or site, or other property, or for any injury or loss of life to persons employed by any Contractor or the public.

All indebtedness incurred for labor, materials, or any cause in connection with each contract, must be paid by the Contractor and the State is hereby expressly relieved at all times from any indebtedness or claim other than that of the contract.

Each Contractor shall indemnify the State against any claims, actions or judgments on account of anything used in his work being, or claimed to be, infringements of letters of patent.

(22) FAILURE OF CONTRACTOR:

Should any Contractor at any time refuse, neglect or be unable from any cause to supply proper, or a sufficiency of any materials or workmen to carry on any of the work of his contract, it shall be lawful for the State, after giving 5 days' wrtiten notice to the Contractor, to provide same to complete the work and to deduct the costs thereof from the sum otherwise then due the Contractor by the contract, or if costs exceed said sum the Contractor shall pay the excess amount to the State and recourse shall immediately be had to the bonds therefor, and the Contractor agrees to waive all claims for prospective damages.

(23) PRESERVATION AND CLEANING:

Each Contractor shall properly preserve and clean his work as the work progresses. At such times as directed, collected rubbish shall be removed, and at completion, the whole work shall be cleaned and all tools, false work, etc., and rubbish shall be removed from the site, each Contractor executing his part or assuming his share of the expenses, all being left in clean and proper condition.

(24) ACCEPTANCE:

No part of the work of any contract shall be accepted until the whole shall have been completed satisfactorily to the State.

In judging the work, allowance for deviations from the original plans and specifications will not be made unless already approved in writing at proper times and in manner as called for.

Should it become necessary, due to developed conditions, to occupy a portion or portions of a building before a contract is completed, it is agreed that same shall not constitute acceptance.

(25) PAYMENTS:

Payments will be made on the 15th of each month during progress of this work, according to terms of the contract. Payments will be for work up to and including last Saturday of preceding month.

The State shall make or cause to be made an estimate of labor and materials furnished under the contract, which shall be based upon

actual measurements of the labor performed and materials furnished and shall show the amounts of preceding estimate or estimates.

For contracts which involve erection or installation at the building, there shall be paid not more than 90% of the estimated value of the whole construction accomplished and not more than 45% of value of material delivered but not incorporated. For contracts in which the work is completed when delivery is made at the site, there shall be paid not more than 90% of the estimated value of material delivered, except that after final delivery a sum of not more than 10% of this 90% shall be retained for 90 days to cover errors found during erection or installation; however, the remaining 10% of the whole sum will be paid 35 days from acceptance, as below.

These retained sums shall be forfeited to the State in the event of failure of the Contractor to conform in good faith to the contract.

When the work of the contract is fully performed and finished, and accepted, the State, after the receipt of all guarantees required, shall pay the total then due the Contractor, except as otherwise stated above, less the 10% of the total contract sum. Thirty-five days after final acceptance of the work, this 10% balance will be paid.

(26) GUARANTEES:

Each Contractor agrees to use and abide by the conditions of the standard form of guarantee, copy of which is herewith shown, for all guarantees required by these specifications, which shall be signed and delivered to the State before the final payment is made.

Besides special guarantees required in the detail specifications, each Contractor shall guarantee that no part of his work shall show defect for one year from date of acceptance.

COPY OF STANDARD GUARANTEE FORM:

Guarantee for.....

We hereby guarantee that the.....
which we have installed .....
at .....
has been in accordance with the drawings and specifications and that the work as installed will fulfill the requirements of the guarantee included in the specifications. We agree to repair or replace any or all of our work, together with any other adjacent work which may be displaced in so doing, that may prove to be defective in its workmanship or material within a period of.....from date of acceptance of the above named structure by the State Department of Engineering, without any expense whatsoever to the State of California, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above mentioned conditions within .....days after being notified in writing by the State Department of Engineering, we, collectively or separately, do hereby authorize said State Department of Engineering to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefor upon demand.

Dated:.....

Signed .....

Countersigned .....

Excavation Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(27) LINES AND LEVELS:

The general lines and levels of the building will be given by the Superintendent. The Contractor shall lay out all lines and levels directly needed for the work and be responsible therefor.

(28) LOCATION:

The lot upon which this specified work is to be done is located on the north side of McAllister Street, between Larkin and Polk Streets, San Francisco. It fronts 412½ feet on McAllister and 120 feet on Polk and Larkin Streets.

(29) SCOPE OF WORK:

There is included in this contract all excavation, pumping, grading, backfilling, care of street paving and bulkheading. The removal of all old bricks, concrete, foundations and other debris on site.

(30) EXCAVATING:

This Contractor shall remove and dispose of all surplus earth, walls, present foundations and other debris now on the lot. This Contractor to store on lot where not to be occupied by building sufficient clean material from excavation for all backfilling, and should too much be taken away, he shall supply the deficiency. Sufficient excavation must be made beyond wall lines of all foundations, pits, trenches, etc., to allow for the installation and removal of all bulkheading and forms.

(31) PUMPING:

Install pumping machinery to clear excavation of water and keep same in operation until flooring of pits and all walls of same are waterproofed and have stood eight days.

(32) BULKHEADS:

The necessary bulkheads must be built to retain the earth of adjacent streets and sidewalks and dirt of lot adjacent to building line. This Contractor shall furnish all necessary bulkheads to retain this earth as far as the needs of his work shall apply. The bulkheads and shoring must be of a design acceptable to the Superintendent, and the braces, etc., must be moved from time to time to accommodate the placing of concrete. Space sufficient to build forms must be left inside all bulkheads for all pits and area walls.

Bulkheading along Redwood Street at the rear wing not to be removed until basement and first floor slabs are poured, and an order issued for removal of same by the State Department of Engineering.

(33) BACKFILLING:

After concrete walls and foundations are placed, the earth must be backfilled around same and settled in place with water. Before the concrete of basement floor, areas, court and sidewalks is placed by others, the earth must be leveled off and tamped by this Contractor to proper levels.

Fill in court yard to levels shown on plans and entrances to same which will begin at street line at each side, forming run-way through lot, and grade earth as shown from run-ways to sidewalk in rear.

(34) OLD WALLS, ETC.:

This Contractor is to remove all old concrete and brick walls, old concrete floors to properly allow the installation of the foundations in accordance with plans. Also he must remove all sidewalks and any other debris on the site. A visit to the site will show the nature and amount of this work. The present brick retaining wall along the Redwood Street lot line in the northeast corner of the lot is to remain.

(35) PAVING:

The Contractor shall take all care of the street during the progress of the work, and upon completion repair same to the satisfaction of the Street Department of the City of San Francisco.

(36) CURBS:

This Contractor is to protect granite curbs of McAllister and Larkin Streets during work of excavation and backfilling; if any portions are damaged, they are to be replaced with new pieces of granite by this Contractor as directed by the State Department of Engineering.

Parker Company

Concrete Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(37) SCOPE OF WORK:

Under this head is included all concrete forms, foundations, grouting of cast iron or steel bases, plates, etc., walls, piers, floors, roofs, fireproofing of steel frame, reinforced concrete columns, walls, beams, girders, lintels and retaining walls, and footings for curb walls, cement finish, sidewalks and court pavements; and all such other work as herein specified, shown on drawings or necessary to the proper completion of all work of concrete nature to the satisfaction of the State.

(38) FORMS:

Forms shall be of lumber surfaced on one side and sized on two edges and free from knot holes and other defects that would impair its strength or adaptability for this work. Boards to be 7/8 inch by 6 inch, set close so as to prevent leakage and braced so as not to spring when concrete is poured. Bracing shall be made of material of sufficient size and ample strength and shall be spaced at intervals so as to prevent all bulging of forms. Improper construction of forms may cause rejection of whole work affected. Set rough side of boards next to concrete, except where concrete is left exposed.

All concrete shall have wood forms except under-side of footings and slabs that are shown to be directly on earth.

Forms shall be put up plumb, true and level and securely tied together with steel wire and with proper provision made for all moldings, openings, inlays and other features as shown and detailed.

Beveled strips, forming a 1-inch chamfer, shall be placed, as directed, in corners of column, beam and girder boxes extending full length of same.

The lowest board of all forms along wall shall be left out; and at columns and pilasters, provide hand holes at bottom not less than 6 inches square; all to be left open until just before concrete is poured.

Tie wires used in forms shall be placed so as to slant downward across form spaces, from interior to exterior. Spreaders in walls, beams and girders shall be of steel bars or angles (no wood of any kind, except nailing blocks, shall be used inside the forms) and spreaders shall be removed as concrete is poured. Upon removal of forms, cut all wires off flush with face of concrete.

All forms shall be cleaned of chips, sawdust and other debris and shall be thoroughly wet before concrete is poured, when and as directed.

No forms shall be removed until so directed by Inspector, but generally forms of walls shall remain in place undisturbed for ten days

and of beams, girders and floor slabs for twenty-one days after concrete is placed. No load shall be placed on any portion of floors within two weeks after forms have been removed from same. Fireproofing forms may be removed in seven days.

(39) CEMENT:

Cement for all work shall meet the latest requirements of specifications and methods of tests for portland cement of the American Society of Civil Engineers and American Society of Testing Materials. Tests will be made by the State and cement must be delivered at the site in ample time for such tests as required. Method of ordering, taking samples and approving cement shall be done so as to suit conditions controlling each particular part of the work.

Average net weight of cement to be 94 pounds per sack, or 376 pounds per barrel. All cement shall be stored in a weather-tight building with wood floor properly blocked up from the ground, all as directed by Inspector. All doors shall have strong padlocks and safety hasps and all keys delivered to Inspector. No package of cement shall be accepted that has been broken or damaged, or in which the cement has begun to set, and this Contractor shall be responsible for same after delivery at cars.

(40) WATER:

All water used shall be clean and free from acids or strong alkalies and the amounts for various parts of the work will be accurately determined by the State. Provide and place hose or piping to extend from water supplies to all points where water is needed, same being of ample size and number for proper flow and quantities as required.

(41) SAND:

Sand shall be of very best quality, clean and sharp, and free from all foreign matter such as grease, vegetable matter, mica, soft or decomposed rock or earth.

Not more than 25% nor less than 10% shall pass a 50 mesh screen and not more than 5% shall be retained on a ¼ inch mesh screen and it shall be evenly graded. It shall show by test an equal strength to Standard Ottawa Sand.

(42) CRUSHED ROCK AND GRAVEL:

Crushed rock, small size, shall be made by crushing a clean, hard, fine grained, granite, basalt, trap rock, quartzite, hard limestone or indurated sandstone. Dust and soft, flat or elongated particles shall be excluded. It shall be evenly graded and shall pass a 1 inch round hole screen and be retained on a ¼ inch round or square hole screen. Not more than 5% shall exceed 1½ inches in greatest dimension. For mass concrete, crushed rock of same quality and of larger size shall be used in conjunction with the above, being all of that material which, after crushing, passes a 1½ inch round hole screen and is retained on a 1 inch round hole screen. Not more than 5% shall exceed 2½ inches in greatest dimension. Clean river gravel may be used in

place of the above mentioned crushed rock, providing that, after crushing, it complies with the sizes and qualities mentioned above. At least 60% of the gravel shall be crushed.

Should it be desired to use a rock not fully meeting the above requirements as to small sizes, the Contractor shall supply a clean, sharp roofing or pea gravel to be added as directed.

(43) REINFORCING STEEL:

Furnish and install all reinforcing steel required for the work. Same shall be accurately placed as shown and of the forms and dimensions indicated. All shall be put together and set in place by mechanics especially skilled in this work. All steel shall conform to the requirements of latest amended Standard Specifications for Medium Billett Steel Concrete Reinforcing Bars adopted by the American Society for Testing Materials. Tests will be made by the State. All steel shall be new and no re-rolled or square twisted will be accepted. Plain or deformed squares may be substituted when approved by the State.

All tying or wiring shall be solid and secure and of No. 16 annealed wire, except as otherwise called for. All anchorage shall be of metal. No wood whatever, temporary or permanent, will be permitted inside the forms.

Concrete walls, so indicated, shall be reinforced with bars of the sizes and spacing indicated and shall be wired together at all points where bars cross. Lap at least 24 inches at splices and wire not more than 6 inches apart. Splices in horizontal bars shall be staggered so that those in adjacent tiers will not be less than 10 feet apart. Splices at corners shall lap 3 feet either side of corner. Also extend bars 1 foot at brick walls. Bars shall be doubled around all openings, the extra bars extending 3 feet in both directions beyond the opening.

Column reinforcing shall consist of longitudinal bars, wrapped with wire spirals, wired to the longitudinal bars every foot in height, or as directed.

All lintels, beams and girders shall be reinforced with bars as shown and shall be securely held in place by proper metal spacing devices, design to be submitted for approval. Stirrups of wire fabric, as shown, shall be used in all beams and girders, wired to the main reinforcing bars and secured at top in such manner as not to be displaced when concrete is poured.

All slabs, so indicated, shall be reinforced with round rods, of the sizes and spacing indicated, wired together at all points where rods cross each other, or with Clinton Fireproofing Company's Electric Welded Wire Fabric, or equal, of the mesh and sizes of wire shown.

The floor slab reinforcement shall be in long lengths so as to extend over as many panels as possible and shall be wired at all splices. Side laps shall be 4 inches and end laps 24 inches. End laps shall be made only over beams and shall break joints so that splices in adjacent widths of fabric shall not occur on the same beam. While the concrete is being poured, the wire fabric shall be lifted into exact position indicated.

At such walls or other concrete, where slabs adjoin but are not poured integral with same, leave proper rods or strips of fabric for incorporating later into slabs, all as directed.

(44) PREPARATION FOR OTHER WORK:

Make all preparations and do all work necessary to receive, and adjoin to, other work, all as directed. Other trades will furnish blocks, strips, bolts, anchors, etc., for their respective work, except as otherwise specified.

This Contractor will be held responsible for and must anticipate the attachment, imbedding or anchorage required for all work on the building and must see that such work is properly placed as the work progresses. Cutting of concrete after it is installed will not be allowed. Carefully examine all of the drawings to determine the relation of the concrete with all other work and make proper agreeable arrangements for carrying on the whole work promptly and accurately and without delay.

Bedding for plates, bases or any other work to be bedded at concrete shall be done with mortar of 1 part cement and 2 parts sand.

All slabs on exterior and where indicated or required on interior shall have positive pitch to drain.

Prepare concrete for tile furring and partitions by leaving approved anchors for each joint vertically and dowels or hangers of proper lengths and centers, also for the setting of brick work, etc., by setting all anchors, tie wires, etc., all as directed by Inspector.

Carefully form rough concrete for plaster and cement moldings, reveals, splays, steps, stairs, rails, etc., as shown.

Prepare for the setting of all steel and iron work and other metal work throughout as required. Set all bases, plates, beams, lintels, etc., in a full bed of mortar.

Wherever woodwork is adjacent to concrete, proper anchors shall be built in. Blocks in jambs of openings shall be spaced 2 foot centers. All rough wood jambs shall be built into place as erected, and anchored with galvanized iron straps. Wood blocks shall be set in concrete at back of all woodwork, except in columns, girders and beams, where metal anchorage shall be used. Blocks shall be spaced 3 feet on centers at back of all wood furring, strips, base, picture mould and other running trim, except where otherwise directed.

Where wood floor strips are laid for wood floors, the space between and under strips shall be filled with a 1:8 broken brick concrete mixture. This filling shall be laid solidly and tamped firmly into place so as to fill all space between and below floor strips. Floor strips must not be displaced. The filling shall be brought up to within ¼ inch of top of strips and shall be placed at the proper time as directed to allow sufficient time to thoroughly dry. Coke fires shall be provided and maintained if required for proper drying.

Suitable reglets shall be made in masonry as necessary to receive flashing and counter-flashing.

(45) PROPORTIONS FOR CONCRETE:

Sizes given for gravel and broken stone are the maximum sizes of greatest dimension of each particle. No variation will be permitted

from these sizes. Materials for plain concrete shall be mixed in the proportion of 1 sack of cement to 7½ cubic feet of aggregate, for reinforced and fireproofing concrete, in the proportion of 1 sack of cement to 6 cubic feet of aggregate. The exact proportions of the aggregate will be determined by the State, but will be approximately 1/3 sand to 2/3 crushed rock.

Materials shall be stored in such a manner as not to mix together and shall be separately and accurately measured as used. The amount of water to be used will be determined by the State at the time of first mixture and shall not be varied except when directed.

(46) MIXING AND PLACING:

All concrete shall be mixed in a batch mixer approved by the State and producing a uniform consistency and color.

Plain concrete, except where otherwise specified, shall also include reinforced footings and outside foundation walls, 12 inches or over in thickness. Reinforced concrete shall be all other concrete containing reinforcing.

The mass must be mixed until there is a uniform distribution of the materials throughout, continuing for the minimum time of 1½ minutes after all the ingredients are assembled in the mixer.

The mixer shall be one into which all of the materials, including water, can be precisely measured. Water shall be measured in approved containers, being adapted to ready adjustment for variation as directed, and accurate delivery.

Concrete shall be mixed to such a consistency that it will flow sluggishly into the forms and about the reinforcement, and can be conveyed from the mixer to the forms without separation of the aggregate from the mortar. Over-wet concrete, either before or after placing in forms, will be rejected.

Concrete shall be conveyed to the place of final deposit immediately after mixing. Deposit in the forms so that no separation of the ingredients will occur and so as to permit of the most thorough compacting, which shall be done by working with suitable rammers and slicing tools kept moving up and down until all the ingredients are in their proper place. Also tap forms as directed to consolidate the concrete. Furnish sufficient competent men to do this work, the number being strictly as required by the Inspector.

If voids are discovered at any time, the defective concrete shall be removed and immediately and properly replaced. Special care shall be exercised to prevent the formation of laitance and to obtain a continuous unbroken density throughout the concrete.

In pouring walls, the surface of the concrete shall be kept level throughout the full extent of the wall and none shall be permitted to flow from one portion to another.

In pouring columns, the whole column up to the level of the bottom of the haunches must be poured within a period of ½ to 1 hour and at least 6 hours ahead of beams and girders.

All concrete lintels shall be cast in place and placed properly to suit the progress and requirements of other work.

Beams and girders, with adjacent floor slabs, shall be poured in a single operation, i. e., a whole panel must be completed before the con-

crete in any portion thereof has begun the final set. At the end of a day's run, headers shall be set along the cross center line of the beams or girders beyond the last panel to be poured and all must be completed as far as these headers. If the pouring of floor slab is stopped at any other point, all the concrete shall be removed to the cross center lines of last adjacent beams and girders, and forms and reinforcing steel thoroughly cleaned of all loose or adhering concrete and materials before concreting is resumed.

No concrete shall be placed in any portion of the work until all the reinforcing for said portion is securely fastened in place nor until the forms are completed and properly braced. No concrete shall be placed before all sleeves, hangers, pipes, conduits, outlet boxes, wood blocking, bolts, anchors, wires, fixtures, etc., that are to be embedded in the concrete, have been set in their proper positions, and this Contractor shall notify others in ample time to have same properly set. He shall also furnish such assistance in setting as required by relation of the work.

When depositing concrete, care shall be taken not to displace reinforcing steel, conduits, pipes, hangers, fixtures, etc., that have been set in place. Carts shall be kept at all times upon platforms or runways, which shall be supported so as not to bear upon the reinforcing.

Before depositing fresh concrete against that which has set, the surface of the latter shall be treated as follows:

The concrete shall be roughened, cleaned of foreign material and all laitance, thoroughly wetted, and then covered with ½ inch of cement grout of 1 part cement and 2 parts sand, and applied just before concrete is placed. For vertical joints, all the stone aggregate shall be exposed by picking. Then drench the surface with water and sprinkle well with dry cement, immediately after which pour the new concrete.

Before starting a new run, all drippings and all debris shall be thoroughly cleaned from the forms, reinforcing, etc. Earth under footings, and all other concrete on the ground, shall be well wet and tamped solid before concrete is placed.

It is absolutely necessary that all concrete be thoroughly wetted night and morning, or more often if required, for 10 days after being placed, and all slabs shall be covered with 1 inch of wet clean sand as soon as hardened sufficiently, and kept continually wet, all as directed.

No concrete shall be placed or used in any part of the work after it has begun to set and no re-tempering will be allowed. No load shall be placed on freshly poured concrete.

(47) DEFECTIVE CONCRETE:

Any portion of the concrete found to be out of line or level, or out of plumb, shall be torn out and properly replaced. Any places showing spalls or voids shall be replaced, or, if so directed by Inspector, carefully patched with cement mortar of 1 part cement and 2 parts sand.

(48) SAMPLES AND TESTS:

All samples shall be judged and tests made according to rules of the American Society for Testing Materials where applicable, unless otherwise specified.

Fifteen-pound samples of cement composed of a small amount taken from promiscuous sacks of each shipment, after delivery on the site, by the Inspector, shall successfully pass the standard tests by the State before same may be used in the work. Delivery must be made 10 days before first pouring and 35 days before use thereafter to allow for the 7 and 28 day tests.

One-half cubic foot samples each of sand and of crushed rock or gravel shall be submitted to the State for testing, allowing at least 10 days before first pouring. Samples will also be taken from each shipment as deemed necessary by Inspector.

Random 18-inch long samples shall be taken from the reinforcing steel and submitted for testing.

The Inspector shall, as directed, take samples of concrete at place of mixing for testing. At an age of 28 days these samples shall develop not less than a strength per square inch of 1400 pounds for 1:7½ concrete and of 1800 pounds for 1:6 concrete. If any sample should fail to develop specified strength, the State shall make tests of such portion or portions of the work as is represented by the sample.

Load tests shall also be made on portions of the finished structure where deemed necessary. Load test expense, except as heretofore stated, shall be borne by the Contractor, who shall afford all facilities for properly conducting an accurate test. Load tests shall not be made until after 60 days of hardening, and loading shall be carried to such a point that 1¾ times the calculated working stresses in critical parts are reached, causing no injurious permanent deformations.

(49) UNIT PRICES:

The Contractor shall file with his bid, on Proposal Form, unit prices of work complete in place, each, for the following: Plain concrete, reinforced concrete, reinforcing, forms. Such unit prices shall be used in computing either deductions or additions to concrete price for any changes in the work.

(50) FOOTINGS:

In case the State should find that the soil at the depths shown on drawings for bottoms of footings is not of sufficient bearing value, or that a satisfactory bearing value can be had at a higher level, the footings shall be carried as much more or less as may be necessary to secure proper foundation.

(51) COLUMN BASES:

All column bases shall be enclosed with concrete at least 3 inches outside of metal.

All bases and bearing plates shall be grouted with 1 part cement and 2 parts sand, mixed continually while being poured to prevent separation of sand and cement.

(52) WATERPROOFING:

The pit for the boilers in the Boiler Room and the pit for the two elevators running to the basement floor shall have a cement plaster

finish coat on floors and walls up to the basement floor level, waterproofed with "Imperial," or equal, as follows:

All concrete to be cleaned with a wire brush and thoroughly wet with water or be given a surface application of Imperial before applying waterproofing coat.

Waterproof cement finish shall be composed of 1 part Portland cement to 2 parts sand, with Imperial added in the proportion of 1 gallon to each sack of cement used, and sufficient water added to give mortar of the proper consistency.

This cement finish shall be applied in two coats, one-half (½) inch thick on walls and three-quarters (¾) inch thick on floors. It shall be troweled to a smooth, even surface with cove at floor. For troweling surface, equal parts of Imperial and water shall be used.

This work shall be guaranteed by the Contractor to be watertight for a period of three years after completion.

(53) FIREPROOFING:

All interior steel columns, also those on exterior not otherwise shown, shall be fireproofed with concrete 3 inches outside of metal. Said columns shall be wrapped with No. 12 by No. 12 fabric, 5 to 9 inch mesh.

All steel beams and girders, unless otherwise shown on drawings, shall be fireproofed with concrete 2 inches outside of metal, soffits of said beams and girders being wrapped with No. 12 by No. 12 fabric, 5 by 9 inch mesh.

(54) FINISHED SURFACES:

All floors, basement to top, except where otherwise marked, shall be cement finished with top surface ½ inch thick, put on within 24 hours after the main slab is poured, troweled to a true and even surface. All finish shall be 1 part of cement and 2 parts sand.

Rough slab shall be cleaned of all scum or laitance, thoroughly wet and sprinkled with dry cement; the top surface to be well pressed into slab. Any top flooring that is loose or has a hollow sound when tapped shall be taken up and relaid by this Contractor.

Sidewalks, surfaces, and wherever else directed, shall be marked off in squares. All cement finished surfaces to be kept moist and protected as directed.

Concrete slabs under floors marked "cork tile" are to have a finish of cement and sand, 1 part cement and 4 parts sand, troweled to a smooth, level surface.

Build brass guides for sliding doors in cement top coat where sliding doors are shown on plans. Brass guides will be furnished by the Ornamental Iron Contractor.

(55) TRENCH:

A 2-inch by 10-inch trench shall be provided in Boiler Room, in front of boilers, leading to sump, as directed by the Inspector.

(56) CURBS, ETC.:

Build skylight and ventilator curbs, coping walls, etc., as shown on plans to be 6 inches thick, of reinforced concrete. Reinforcing shall

fasten to slab of roof. All curbs shall be at least 6 inches high at highest point of roof. Cement floor of Attic shall be entirely surrounded by a cement curb as shown on drawing No. 7. Grade Attic floor to drains.

(57) ROOFS:

Rod flat roofs that are to be covered with composition roofing with 1 part cement and 4 parts sand so that no stones project, and leave an even surface for Roofing Contractor.

(58) COURT PAVING:

This Contractor shall tamp earth of rear courts and approaches to same from streets, lay a 6-inch floor of 1, 2½ and 5 concrete graded to outlet and to levels shown and cover same with a 2-inch layer of standard city specification bitumen pavement, well rolled to a hard wearing surface.

(59) VAULTS:

All vaults are to have 6-inch concrete walls from floor to floor slab above, reinforced with ½-inch rods, 18-inch centers both ways, and after doors are set this Contractor to grout same in solid with grout same as specified for bases.

(60) CONCRETE STAIRS:

Fire stairs shall be reinforced concrete with cement finish as shown on drawing No. 104. Stairs from boiler room floor to boiler pit to be reinforced concrete with cement finish.

Stairs from landing above sixth floor to Attic shall be reinforced concrete with cement finish, as shown on drawing No. 104.

The landing platforms, including steps between same, of the main stairways between the basement floor and first floor shall be framed with reinforced concrete for marble and ornamental iron finish, as shown on drawing No. 104.

(61) SIDEWALKS:

Sidewalks on all four streets around lot from building line to curb shall be new, and this Contractor shall lay a 4½-inch walk, including top coat, as per grade and color required by San Francisco ordinance.

(62) GUARANTEE:

Waterproofing work shall be guaranteed watertight for three years.

Structural Steel and Iron Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(63) SCOPE OF WORK:

The work included is: All cast iron column bases; all steel columns; all steel channels, beams and girder beams; and all such plates, bolts and other structural steel and iron necessary for the proper completion of the entire work under the head of Structural Steel and Iron Work to the satisfaction of the State. All materials shall be delivered to the building site by this Contractor and unloaded and stored where directed by the Inspector. Erection bolts will be furnished by the Erection Contractor.

(64) WORKMANSHIP:

All workmanship, as well as all details of construction, shall comply with paragraphs 59 to 103 and 127 to 155, inclusive, of Schneider's "Specifications for Structural Work of Buildings," in so far as they concern this work.

(65) INSPECTION:

All steel shall be inspected from the melt until the delivery of the furnished material to the site. Inspection shall include surface, mill and shop inspection. The Contractor shall notify the State Department of Engineering when work is ready for inspection and no material will be accepted that has not been inspected. All inspection shall be done at the expense of the State, to whom all reports shall be made.

(66) TESTS:

Samples of all materials shall be furnished by the Contractor to the State for testing. Samples will be taken by the State in such manner and at such times as it may require. The expense of the tests will be paid for by the State.

The acceptance of any material shall be dependent upon satisfactory results of the tests. Whenever possible necessary facilities shall be afforded so that tests shall be made at the place of manufacture if so desired by the State.

(67) SHOP DRAWINGS:

Contractor shall make and provide all shop, detail and other drawings that may be required for this work. All such drawings, details, etc., shall be submitted in triplicate to the State Department of Engineering for approval and must be so approved before any work is proceeded with. The approval of shop drawings will not relieve the Contractor of any responsibility for errors contained therein or for

the accurate and complete execution of the work. Errors, even though not found until erection, shall be made good by this Contractor.

(68) STEEL:

All structural steel shall conform to the Standard Specifications for Structural Steel for Buildings as adopted 1901 and revised in 1916 by the American Society for Testing Materials. All steel, except for rivets, shall be of the grade known as "medium steel." All rivets shall be of the grade known as "rivet steel."

All material shall be new. No re-rolled material will be accepted.

Where Bethlehem structural shapes are called for, other shapes or built-up members may be used if of equivalent strength and approved in writing by the State.

(69) CAST IRON:

All castings shall be tough gray iron, true to pattern, free from cracks, flaws and excessive shrinkage. Cast iron shall conform with the specifications for medium gray castings, as adopted by the American Society for Testing Materials.

One sample shall be submitted to be tested in conformity with the above specification for each ten tons of furnished castings, provided, however, that there shall be at least one sample for each melt.

(70) RIVETS:

All joints not otherwise detailed shall be riveted. All rivets shall be ¾ inch diameter unless otherwise shown. The following rivet values are permissible:

For shop rivets:	Single shear,	10,000 pounds per sq. inch.
	Bearing,	20,000 pounds per sq. inch.
For field rivets and bolts:		
	Single shear,	8,000 pounds per sq. inch.
	Bearing,	16,000 pounds per sq. inch.

(71) PAINTING:

All structural steel and iron work, before leaving the shop, shall be thoroughly cleaned of all mill scale, dirt and rust by thorough scraping and wire brushing. Immediately after cleaning, all steel and iron work shall be given one coat of red lead and oil paint composed of 28 pounds of pure lead pigment to 1 gallon of pure raw linseed oil. To each gallon of this may be added, at the discretion of the Inspector, not more than ½ pint of petroleum spirits and not more than ½ pint of drier.

The paint shall be worked into all joints and corners and thoroughly brushed out over all surfaces. In riveted work the surfaces coming in contact shall each be painted before being riveted together. Parts of columns at front walls that are not readily accessible for painting after erection shall be given two coats of the above paint.

All paint materials shall be delivered in their original packages with seals unbroken and opened in the presence of the Inspector. The

materials shall be used as taken from the packages without cutting or the addition of any material whatsoever except as directed.

Red lead pigment shall be of high grade quality free from all adulterants, shall show on analysis not less than 97% of true lead (Pb304) and shall be guaranteed against hardening in the original container if kept sealed at ordinary temperature for a period of three months. The color shall be a clean and pure tint. The oil shall be pure linseed oil, complying with the specifications of the American Society for Testing Materials, shall be aged at least one month and shall contain not more than 1½% of sediment by volume. The drier shall be a light colored drier, shall be guaranteed free from rosin, and to contain both lead and manganese, the proportion of lead being not less than three times that of manganese.

As required by the State, samples of each material delivered at the shop shall be taken by its Inspector and sent for testing. No material shall be used until samples of same have been tested and approved by the State. All materials not passing the test will be rejected and must not be used and must be removed at once from the premises. The paint shall be dry before loading for delivery.

(72) PROTECTION:

During fabrication and shipment all work shall be properly protected from damage by accident or otherwise, and all broken, damaged, or otherwise defective parts shall be repaired by this Contractor at his expense and the entire work shall be left satisfactory to the State in every particular.

Structural Steel Erection

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(73) Scope of Work: The work included is the erection of all structural steel and iron work, all cast iron column bases, all steel columns and all channels, beams and girder beams, and all such plates, bolts and other structural iron necessary for the proper completion of entire work under the head of Structural Steel and Iron Work to the entire satisfaction of the State.

(74) Workmanship: Workmanship shall be equal to the best modern practice. All joints not otherwise detailed shall be riveted. All rivets shall be ¾ inch diameter unless otherwise shown.

Pneumatic hammers shall be used whenever possible. Drifting to enlarge unfair holes will not be allowed. Rivets shall look neat and finished, with heads of approved shape, full and equal size. They shall be centered on the shank and shall grip the assembled pieces firmly. Rivet shanks shall completely fill the holes. Riveted members shall have all parts well pinned up and firmly drawn together with bolts before riveting is commenced.

(75) Erection: Contractor shall furnish all plant, tackle, erection bolts, scaffold, staging, etc., required in the erection of all structural steel and iron work and shall co-operate with other contractors in all ways to facilitate the progress of the work. All structural steel and iron work shall be erected at the proper time during the progress of the building and fixed in the building with the utmost care to prevent accident. The Contractor will be held responsible for all damage resulting from accident occurring through the steel erection. Cast iron column bases will be set by this Contractor, but the grouting will be done by the Concrete Contractor.

(76) Painting: After the steel and iron work is in place, it shall be thoroughly cleaned, all abrasions and defects in the shop coat shall be painted over. Use red lead paint as per paragraph 71.

All members of steel and iron work in front outside walls, not entirely enclosed in concrete, shall be painted one coat of Dixon's Silica Graphite paint or equal, natural gray covering all exposed surfaces. All such surfaces that are not readily accessible shall be painted before erection.

The paint shall be delivered to the job in their original packages with seals unbroken and opened in the presence of the Inspector. The materials shall be used as taken from the packages without cutting or the addition of any material whatsoever.

Barton Contract

Brick Work and Terra Cotta

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(77) **Scope of Work:** It is the intent of this specification and the accompanying plans to care for furnishing and setting of all brick for walls, fireproofing exterior columns and backing of granite for the entire exterior walls of building; all interior brick and terra cotta partitions, basement to roof, lining of all vaults and furnishing and setting of terra cotta of vestibule, and exterior as specified or shown. Exterior walls to be faced with granite on three fronts and returns, including vestibule, and to be backed with brick. Rear walls and court walls to be concrete and not included in this specification.

(78) **Sand:** Sand must be clean sand with coarse grains predominating and free from clay, sticks and other impurities. It shall be composed of particles of such size that not more than 25% nor less than 10% shall pass a 50-mesh screen and all shall pass a 10-mesh screen.

(79) **Water:** Water to be free from acids and strong alkalies.

(80) **Lime:** Lime to be freshly burned and thoroughly slacked at least two weeks before using.

(81) **Cement:** Cement for all work shall meet the latest requirements of specifications and methods of tests for Portland cement of the American Society of Civil Engineers and American Society of Testing Materials. Tests will be made by the State and cement must be delivered at the site in ample time for such tests as required. Method of ordering, taking samples and approving cement to be done so as to suit conditions controlling each particular part of the work. Average net weight of cement to be 94 pounds per sack, or 376 pounds per barrel.

All cement shall be stored in a suitable weather-tight building constructed by this Contractor and acceptable to the State Department of Engineering. The floor of the building shall be properly blocked up from the ground so as to prevent dampness reaching the cement. The door shall be provided with a strong padlock and a safety hasp. Keys to padlock shall be delivered to the Superintendent. No packages of cement shall be accepted that have been broken or damaged, or in which the cement has begun to set.

(82) **Brick:** All common brick to be strictly hard burned, reasonably square and true, uniform in size and made with sharp arrises and even surfaces.

(83) Brick Backing: Granite work and terra cotta to be backed with brick from grade line to top of walls as shown.

(84) Terra Cotta: All work of ornamental cheneau top of building and vestibule between granite and plaster ceiling at third story level, including all ornamental and plain bands, sills, panels, etc., to be matt glazed finished terra cotta, except where marble inserts are called for. Color to match color of granite and sample to be submitted for approval.

All terra cotta to be hard burned and have straight exposed sides with sharp corners, free from defects or broken parts and to closely follow setting drawings.

All surfaces not exposed to be roughened, presenting a uniform surface for joints.

All bands and mouldings shall have a bed exceeding the greatest projection at least one inch. All projections to have washes.

(85) Trial Set: All terra cotta to be set up at works so that when same is placed in building all pieces will be correct size.

All terra cotta to be delivered in good condition and in lengths to fit building and this Contractor to do all replacing of any imperfect pieces that may be rejected.

(86) Models: Submit plaster models of all ornamental work for approval to the State Department of Engineering.

(87) Setting Plans: Furnish a full set of plans marked to correspond with marks on terra cotta and showing all iron anchors, rods, angles, etc., required to properly anchor terra cotta, and submit to State Department of Engineering for approval.

(88) Anchors: Furnish and set all anchors, clamps, dowells, hangers and special metal work not included in structural steel shown or required for all terra cotta work; and all anchors for anchoring brickwork to steel as required by San Francisco Building Ordinance. Terra cotta anchors where not otherwise shown to be at least ¼ inch in diameter.

(89) Safety Devices: Safety window devices will be installed by carpenter.

(90) Mortar: All mortar used for laying common brick, terra cotta and tile partition work shall be composed of one (1) part Portland cement and three (3) parts sand, with the addition of not more than ten (10) per cent of lime putty to total volume of mortar.

The mortar shall be mixed fresh when it is to be used. The cement and sand shall first be mixed together and then the lime putty shall be added, using only the necessary quantity to make the mortar work properly on the trowel and in no case more than the ten (10) per cent above specified. The mortar shall be used immediately after mixing and any that has set in the box or on the platforms shall not be used.

(91) **Grout:** Grout around all columns, wall beams and back of stone where space is too small for brick backing, etc., with cement and sand, one to one, to make all work tight.

(92) **Lintels:** Provide steel angle lintels over openings for radiator grilles main lobby first floor and vent grilles on north wall of Supreme Court Room as called for on drawings No. 105 and No. 107.

(93) **Arches:** Build segmental brick arches over basement openings, as shown on the drawings and back up the semi-circular stone arches of the fourth story with brick arches as shown on drawings Nos. 100 and 101.

Build brick relieving arches behind all stone lintels as shown on drawing No. 100.

(94) **Laying and Bonding:** Common brick to be laid with special care, rubbing down to a close, true bed, laid straight, true and most carefully bonded, with headers every sixth course.

All brick to be wetted just before being laid in a thorough manner, and laid in the wall while still wet, with full shove joint. The bond to be done in such a manner that the wall will be equally well bonded throughout its entire thickness.

(95) **Joints:** Joints of all terra cotta work to be pointed up with mortar colored as directed by the State Department of Engineers.

(96) **Jambs:** Care must be taken that courses are laid to suit figured heights and dimensions of openings, it being remembered that brickwork is in all cases to be kept 3/8 inch from woodwork at heads of windows.

(97) **Partition Anchors:** Leave proper anchors of 3/4-inch mesh to build into joints of tile partitions.

(98) **Present Brick Retaining Wall:** Build sufficient brickwork on top of present brick retaining wall, extending part way along the Redwood Street side of the lot to bring same up to finished sidewalk grade. See drawings No. S1, No. S2, No. 2 and No. 9.

(99) **Tile Partitions:** All partitions shown on plans from basement to roof to be terra cotta tile 12 inches by 12 inches, 3 inches thick for basement, second, third, fifth and sixth stories; 4 inches thick for first and fourth stories; and 6 inches thick for all walls and partitions over 15 feet in height and where marked 6 inches on plans. Use 4-inch or 6-inch tile wherever necessary for the passage of pipes through same.

All exterior wall furring first to top to be metal lath, but this contractor to furr pipes and interior columns where shown.

All vaults to have walls furred with 3-inch terra cotta tile from floor to ceiling.

All tile to be anchored with an approved clip of 24-gauge galvanized iron.

All tile to be scored for plaster on faces and for mortar on bearing surfaces.

All tile to be anchored to bucks with anchors of 22-gauge galvanized iron every 12 inches in height. Where hollow spaces are vertical the anchor is to be nailed to buck with two 8d. nails and clamped into partition of tile, and where spaces are horizontal the anchors to extend to end of tile and bent into hollow. All anchors to be exact width of hollow and to jamb in tight.

Carpenter Contractor will furnish ground blocks and this Contractor is to build same in terra cotta partitions where directed.

(100) Protection: Contractors must use proper precaution that walls do not move from position until mortar has dried.

Suitable bracing must be applied when required tor safety of the work.

(101) Cleaning Terra Cotta: At completion of work, clean down with acid and water all exposed terra cotta work. Care to be taken that acid does not come in contact with marble or stone.

Granite

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(102) Scope of Work: This specification and accompanying plans are intended to cover furnishing and setting of granite for all plain, moulded and carved surfaces of building on three fronts and returns at rear from sidewalk line to bottom of cheneau and to include all granite steps, platforms, floors, street curbs and flagpole bases, turned balusters.

(103) Granite: All granite to be best quality Raymond or equal, a sample of which must be submitted to the State Department of Engineering for approval, showing quality and finish of same. All granite to be six cut work of sections shown on detail drawings. Floors of platforms and vestibule to be 4 inches thick, laid in solid bed of cement mortar.

(104) Models: This Contractor to have plaster models made of all ornamental sections and have same approved by the State Department of Engineering. All finished ornamental work to exactly follow the approved models.

(105) Joints: Joints must be where shown on drawings and all plain, moulded, weathered, sunk, throated work, grooves, chases, holes, back joints, fair edges, joggles, reglets, dowels, cramps, and lewis holes, etc., that may be necessary in any part of the work, though not particularly shown or specified in the different parts of same, and all necessary cutting required in properly fitting the work, or to permit of the erection of other works, shall be carefully performed in the most workmanlike manner; and a sufficient number of trimmers and fitters shall be kept on the building to do such fitting. All beds and joints shall be sawed full, true, square, level and plumb, using not larger than $\frac{3}{16}$-inch joints. Any large cavities, slack beds or stones short of the required dimensions will not be accepted.

(106) Finished Surfaces: All plain faces to be true and perfect; all mouldings, angles, carved work, etc., to be cut sharp and clean. All projections to have throating cut on the underside and weathered on top. No internal mitres to be cut on moulded or other work. All sills to be sunk, weathered and throated. Lewis holes to be placed so they will be covered by other stones.

(107) Setting: Each and every piece of granite must be carefully marked and diagrams or setting plans (approved by the State Department of Engineering) of same shall be prepared by the Contractors for their setters. Each piece to be anchored to brick or concrete work, and where possible to be anchored to steel.

All granite work to be delivered at site properly boxed, if necessary to protect edges or carving, all to be in perfect condition and in

consecutive order for setting in building. No stone to be less than 4 inches thick, and every sixth course to be 8 inches or 9 inches for bonding.

(108) Carving: All carving to be up to standard and done in a thoroughly workmanlike manner by experienced carvers and to follow closely models or full size details.

Leave all carved work in perfect condition to the entire satisfaction of the State Department of Engineering on completion of the work.

(109) Scaffolding, Etc.: All scaffolding, centers, enclosures, derricks, hoists, etc., required by the setters or carvers necessary to complete work to be furnished by this Contractor.

(110) Mortar: All stone to be set in mortar composed of one part lime to seven parts sand. After the above mortar is slacked, use one part of an approved stainless cement to three of lime mortar.

(111) Anchors: This Contractor to furnish and set to the satisfaction of the State Department of Engineering, iron anchors to properly anchor granite to the iron, concrete or brick work; each piece to have at least two anchors ⅜ inch diameter and 12 inches long, and where necessary to anchor to steel, anchor to be longer and bent while hot around same. Care shall be taken in anchoring header stones.

(112) Curb: Street curb of McAllister and Larkin Streets will not be disturbed except for the cutting of runway of Larkin Street curb. This Contractor to furnish new curb for Polk Street, using same section as curb of McAllister Street, and on Redwood Street furnish a new 6 inch by 16 inch curb with corner returns to Polk and Larkin Streets. All curbing to be set at City Levels and where shown, to be set on concrete foundation furnished by Concrete Contractor.

(113) Cleaning Granite: At completion, thoroughly clean and point all work and leave same in satisfactory condition.

(114) Cutting, Etc.: This Contractor to do all necessary cutting and chasing to fit the work of other mechanics.

(115) Protection: After work is all set, this Contractor to properly box and cover all projections, steps and arises, and be responsible for same until building is accepted and occupied.

Parker Hew Contract

Carpenter and Mill Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(116) Scope of Work: It is the intent of this specification to cover all rough and finished carpenter work, basement to roof, including roof dormers, etc.; and also all carpenter work shown on plans or referred to herein; and the furnishing of all the mill and interior finish necessary to complete building. This Contractor to submit name of mill to furnish interior millwork. Furnish a sample of oak to be used in building, and all oak not similar to sample to be rejected, and this Contractor to stand cost of replacing same.

(117) Ordinances: All carpenter work such as temporary well enclosures, temporary sidewalks, etc., referred to in building ordinance for safety of public and men on building is considered as part of this specification. Sidewalk and enclosures to be moved and replaced where necessary, to allow other contractors to complete their work.

(118) Ladder: As soon as steel is erected to various floor lines, this Contractor shall build and set a ladder to reach from floor to floor, basement to top; same to be of three 2-inch by 6-inch standards with 1 by 4-inch cross rails, making a 4-foot-wide ladder. Move same from time to time until stairs are completed and then cover all marble treads with 1 by 8-inch boards fastened to edge with 1 by 4-inch runners at each side, and on completion of building remove same from building.

(119) Office: Build a ⅞ by 4-inch surfaced T. and G. office for the State Department of Engineering and Superintendent; same to be at least 12 feet by 15 feet and to include three windows and door and all hardware. Cover roof with two-ply Malthoid or other approved waterproofing paper put on as per manufacturers' directions.

(120) Temporary Closet: Build temporary water closet for men at work on building. This Contractor to include all work except plumbing.

(121) Templates, Patterns, Etc.: Furnish and set all templates, patterns, wood lintels, wood nailing blocks, grounds, etc., to assist other mechanics, and do all cutting or patching of carpenter work required by other trades.

(122) Bucks: Furnish and set all door, interior transom and window bucks on all floors. Bucks to be made of Oregon pine, 2 inches by width of finished plaster partition, sized to form plaster guide and grooved for wire chase. Head of buck to be width of jambs and securely nailed to jambs.

(123) Blocks: Furnish and deliver to mason 4 inch by 4¾ inch wood blocks plowed to fit tile to be built into all tile partitions for

fastening grounds for base, trim, wainscot, paneling, etc., and on metal furring place blocks for nailing grounds at proper height to receive trim.

(124) Grounds: Furnish and set grounds for all door and window trim, base, guides for Plastering Contractor, etc., securely fastened on. Merrit's spot grounds or equal, put on with plaster of Paris 2-foot centers for picture moulds and 12-inch centers for base and other trim can be used instead of blocks and grounds.

(125) Curbs: Furnish and set 2-inch by 6-inch skylight and vent plates on all roof skylights and vents, bolted to concrete with ½-inch by 12-inch bolts. Furnish bolts to Concrete Contractor to be built in.

(126) Roof: When Concrete Contractor has his forms set for concrete of pitched roof and walls of dormers, this Contractor to set 1½-inch by 2-inch beveled sleepers 32 inches on centers, and when concrete is set to cover same with 1 by 6-inch, No. 2, T. and G. Oregon pine, surfaced one side, laid close and left ready for slate.

(127) Plank Walk and Foot-Boards: Build plank walk in attic of 1-inch by 8-inch planks on 3-inch by 6-inch stringers as shown on drawing No. 7.

Provide 1¼-inch by 12-inch foot-boards, supported by two No. 4 gauge wires every 6 feet, to extend from plank walk in attic to all valves on steam main and risers as shown on drawing No. M16. Supporting wires to have ends looped over ½-inch steel rods, 12 inches long, which are to be imbedded in the concrete of the roof slabs above the reinforcing steel.

(128) Preparing for Sheet Metal: Build wood ridge for copper ridge roll and prepare all bearing surfaces for copper or galvanized iron by building wood bearing under same.

(129) Window Frames: Box frames to be ⅞-inch box with 1⅛-inch pulley stile, ⅝-inch parting strip, 1½-inch head, 3-inch by 7-inch sill with brass faced roller bearing pulley, with 2½-inch wheel for chain, all as detailed. Staff bead as detailed.

Chain to be steel, copper plated, having a tensile strength of not less than 300 pounds, with cast iron weights to exactly balance sash.

All swing and pivot sash windows to have 2-inch plank frames and sills, as shown and detailed.

Large frames of third and fourth story circular head windows to be as shown on Detail Sheets Nos. 100 and 100a.

All joints of window frames to be put together with white lead. All joints between frames and stone or brick to be caulked with oakum before staff beads are set.

(130) Safety Devices: Furnish and install Royal or equal safety bolts for safety belts in all window openings, except basement and except in first-story windows having granite jambs. These devices to be fastened to the woodwork of the window frames.

(131) Sash: All exterior sash to be Port Orford cedar or sugar pine with 2-inch by 2½-inch side and head stiles, bottom stile 2 inches

by 4½ inches, meeting stile 2 inches by 1½ inches, with horns as detailed and wood stops for glass.

(132) Sleepers: For all wood floors where marked on plans, place 2-inch by 3-inch surfaced sleepers, 12 inches on centers. Do all shimming with redwood shingles to bring sleepers perfectly level, block between doors to give proper nailing for all floors.

(133) Wood Platforms and Steps: In Supreme Court Room, fourth floor, build platform in front of judges' bench of ⅞-inch by 4-inch T. and G. pine on 2-inch by 4-inch joists, 16-inch centers, to receive cork tile floor, which will be laid by the Tile Contractor. Face of platform to be ⅞-inch by 6-inch cedar, with ⅞-inch by 1½-inch oak nosing, with ⅝-inch by ⅞-inch oak mould under. Platforms against curved wall of Court Room to be similar to above. Steps leading from floor of Court Room to Judges' bench to have 1¼-inch treads to receive cork tile and ⅞-inch cedar risers with nosings as specified for platform.

In Appellate Court Room build low platform in front of Judges' bench same as specified above, except that linoleum will be laid over same (by another contractor) instead of cork tile. Steps to Judges' bench in Appellate Court to have 1¼-inch oak treads with ⅝-inch by ⅞-inch oak moulding under and ⅞-inch risers. Wood platforms in large and small Court Rooms on the fifth floor and in the three class rooms on the sixth floor to be framed with 2-inch by 6-inch Oregon pine joists, 16-inch centers, and covered with a rough floor of 1-inch by 6-inch surfaced Oregon pine. Finished floor to be clear, quarter-sawn oak, ⅞-inch by 2¼-inch T. and G., and is to be finished same as specified for oak floors. Provide 1¼-inch by 3¾-inch oak nosing around edges of platforms, with ⅝-inch by ⅞-inch oak moulding under. Steps to be same as specified for Appellate Court Room.

(134) Wood Floors: Floors of the Governor's Office, Reception Room, and Pardon Board's Office on the second floor to be clear, quarter-sawn, white oak, ⅞-inch by 2¼-inch T. and G., with borders as shown on drawing No. 106. All oak floors to be blind nailed, with butt ends matched and in as long lengths as possible—no lengths less than 6 feet will be accepted except in borders.

Oak floors to be scraped, sandpapered and finished with a coat of paste filler colored as directed by the State Department of Engineering, a coat of white shellac and two coats of wax well brushed out. The last coat of wax to be applied after painting of rooms is finished and when directed by the Superintendent.

(135) Scaffold: In entrance vestibule and Supreme Court Room this Contractor to erect a skeleton scaffold of 2-inch by 6-inch lumber so that Ceiling Contractor, plasterer, painter and other contractors can work on same and tear same down on completion. Care is to be taken so that the walls will not in any way be scraped or scratched. Various contractors to supply all their own movable boards.

(136) Wood Vent: In telephone battery room in basement build an 8-inch by 8-inch wood vent with grooved joints, white leaded together and run through wall with an 8-inch by 12-inch louvred frame to outside.

(137) Flag Poles: Furnish and set two flag poles on platform and three from building of size shown, with copper balls with gold leaf covering. Poles to be painted three coats of lead and oil by this Contractor before erection. Furnish and set ¼-inch diameter bronze wire rope halyards, and Bolander & Halloweil flag pole top, or equal, to fit top of poles.

(138) Telephone Closets: Doors and casings of these closets and electric cabinets in Boiler Room and Telephone Exchanges on the fourth and fifth floors to be same as specified for rooms.

(139) Interior Finish: All finishing lumber shall be selected, clear stock, thoroughly seasoned and kiln dried, to be uniform in color and free from sap, knots, large slashed grain or other defects.

All panels and veneer work herein specified to be five-ply work, guaranteed for one year against cracks and raised surfaces and done in a first class and workmanlike manner. All wood used for natural finish to be first quality, kiln dried, selected grain and color.

All interior trim and finish to be moulded according to full size drawings, put together in a first-class manner, sandpapered and left ready for natural finish or painting, of size given herein or detailed.

All trim to be grooved or hollowed on the back and where trim joins plaster it shall be scribed and fitted perfectly so as to leave no crack or open joint. All casings to be mitred with keyed and glued joints; door casings to have plinths, also window casings where shown or called for.

There shall be no splicing of base, picture moulds, wainscot caps, rails or cornice moulds except in lengths over 12 feet. All built-up moulds, etc., are to be tongue and grooved and put together with glue.

All nails and brads for finish to be put in the quirks of mouldings and set in for puttying. All dimensions given for finish work are for finished sizes.

All trim, panels, or other interior finish to be primed on back (wall side) by painter before being set.

(140) Carving: All carving to be carefully executed according to full size details by experienced wood carvers and samples of carving to be submitted to the State Department of Engineering for approval before starting the work.

(141) Wood: All wood finish, except where otherwise called for, first to sixth floors inclusive, to be white oak for all doors, casings, trim, picture and wire moulds, screen partitions, etc. All wood to be selected omitting heavily slash grain. All panels to be quarter-sawed veneer. Wood of basement, and interior of all vent shafts to be straight grain Oregon pine.

(142) General Trim: Base, door and window trim to be ⅝ inch thick moulded, door jambs 1⅛ inch with mould planted on. Picture and wire moulds as detailed. Door and window stops ½ inch thick. Glass stops 7/16 inch thick.

All rooms, basement to top, except where otherwise specified, to have general trim as shown on sheets No. 103 and No. 1000, to consist of base, door and window trim, picture mould and basin cabinet. All corridors to have wire mould and door and transom trim as shown on sheets No. 103 and No. 1000.

(143) Stops, Etc., for Other Work: No glass, mirrors or canvas will be furnished by the Carpenter Contractor, but he shall furnish all wood stops, backing, grounds, etc., for same and do all fitting of stops.

(144) Spandrels: Arched opening of fifth story to have spandrels behind the windows lined with veneered white cedar as shown on drawing No. 100. Stools of these windows to be set with screws so as to be removable and the opening cased up square on the inside with oak veneered jib panels in upper part of sash.

(145) Counters and Rails: In addition to general trim, rooms where counters and rails are shown on plans to have oak counters, rails, gates, all to be as detailed on sheet No. 103. All counters to be fitted with drawers, lockers and shelves on back side, and provided with money drawers, glass screens and sliding sash where shown on plans.

(146) Doors: All interior doors except as below to be 1¾ inches thick, built up with wood cores and five-ply veneered panels, with wood stops where glass panels are shown.

Exterior main entrance doors to be mahogany on outside and oak on inside, 2 inches thick. Doors to attic, elevator shaft and boiler room to be hollow metal, including jambs and trim, and will be installed by the Sheet Metal Contractor.

All stall doors in toilet rooms and doors to cabinets to have solid oak stiles and rails 1⅛ inches thick with single five-ply panel oak both sides.

Exterior doors from rear court to basement to be solid redwood 2 inches thick for glass as shown. Small doors to skylights and furred spaces behind elevators to be redwood 1½ inches thick for metal covering.

All doors to be same finish as rooms and corridors in which they occur and when rooms on opposite sides of doors have different finishes, the doors will be finished to match both rooms on their respective sides.

(147) Transoms: All corridor doors, except where otherwise shown, to have transom sash 1½ inches thick, with wood stops, same wood as finish of doors.

(148) Glazed Partitions: Build glazed partitions as shown on drawing No. 103. All trim, base, etc., same as typical. Partitions marked "A" on plans to have plaster wainscot and partitions marked "B" to have wood paneled wainscot.

(149) Cabinets: Furnish and install cabinets for lavatories and clothes closets where shown on plans according to drawings No. 1004, built of oak. Cabinets without lavatories are to have one shelf each as shown on the ⅛-inch scale plans. Where cabinets set against columns, the spaces between the ends of same and plastered wall are to be closed off with filler panels of same detail as cabinets.

Where shown on the plans provide oak lined cabinets for hose reels, with 1½-inch oak doors. Provided with oak stops for glass panels.

(151) Blackboards: This Contractor to furnish and set slate blackboards, with wood furring strips, oak trim, stops and chalk rail in the class rooms, sixth floor, as shown on drawings Nos. 5 and 7.

All slate for blackboards to be best quality, hand-finished natural slate 4 feet 6 inches high and ¼ inch to ⅜ inch thick.

Spaces 5 feet or less to be in one piece; spaces 5 feet to 10 feet in two pieces; and proceed likewise with larger spaces. Slate to be ground straight and true, to be fitted tight and glued at joints; and after completion of setting to be shaved and scraped to a uniform, straight, smooth surface.

(152) Entrance Vestibule: Door openings, including first and second story section, to have frames of wood, mahogany on outside and oak on interior, including all pilasters, cornice moulds, sash and glass stops.

(153) Supreme Court Room: All woodwork of the Supreme Court will be Port Orford cedar except nosings of steps and platforms, which will be oak, and top of Judges' bench, which will be mahogany. Balustrade to be wood with turned balusters; wainscot, pilaster bases, trim, paneled wainscot with pilasters behind Judges' bench and paneled front of Judges' bench with carved ornament to be wood. See drawings No. 12 and No. 107.

Large panel in back of Judges' bench to have 2-inch by 2-inch wood rebated grounds 34 inches on centers, set vertically with ⅝-inch by 2-inch strips over same, grooved and provided with splines to fasten canvas as shown on drawing No. 107. This Contractor is to furnish and install between these grounds a backing of "Akoustikos" felt 1 inch

thick, but the canvas will be put on by another contractor. Wood wainscot on north wall in back of Judges' bench to have grounds deadened with hair felt, which is to be tacked on the face of same and backs of panels covered with 3-ply building paper glued on.

Ceiling light to have wood bars fastened to iron frame with screws as shown on drawing No. 105, the iron frame to be furnished by another contractor. The vestibule of the Supreme Court Room is to be framed with 2-inch by 4-inch studs 16 inches on centers, 2-inch by 6-inch roof and ceiling joists 16 inches on centers, and 6-inch by 6-inch girder over main doorway with wrought iron joist hangers. Vestibule to be paneled on the Court Room side with Port Orford cedar and on the inside with oak, including ceiling, as shown on drawings Nos. 12 and 107. Cornice to be oak moulded and secret door to electric cabinet to have paneling secured to face of same. Roof of vestibule in Court Room to be covered with No. 1, ⅞-inch by 4-inch T. and G. pine. Entrance doorway from fourth floor lobby to vestibule to have moulded architrave, cornice with modillions, paneled frieze and carved consoles of oak. Transoms to be stationary, with paneling on the inside to match paneling of vestibule. Doors to be rebated at top and to be provided with an astragal at meeting stiles.

(154) Governor's Office and Reception Room: Governor's office to have paneled walls, moulded trim, moulded cornice, pilasters, carved caps and paneled doors as shown on drawing No. 106. Windows are to be fitted with secondary sliding sash inside of regular sash, 1½ inches thick, made to slide into pockets lined with pine. Hangers for sliding sash to be Richards-Wilcox Manufacturing Company's or equal, and are to be of the ball-bearing type with drawn steel tube track with necessary brackets, to be furnished and set by this Contractor. Doors to closet and lavatory to be secret doors with the paneling planted on same. Provide for concealed radiators with hinged panels at sides. Galvanized iron work and registers will be set by the Heating and Ornamental Iron Contractors.

Reception Room to be similar to Governor's Office except that the secondary sliding sash will be omitted; the cornice will have raised panels and turned ornaments planted on; the entrance door will have turned finials and carved consoles; there will be no pilasters.

Closet and lavatory in Reception Room and closet in Governor's Office to have walls between same and above rooms formed by the paneling, which will be finished both sides, but the other three walls will be plastered and have wood base. Both closets to have 12-inch shelf, ⅞-inch by 6-inch rebated hook strips and turned rod and roses for coat hangers. All wood work of the Governor's Office and Reception Room to be gum wood. Mill to submit sample.

(155) Pardon Board Office: Pardon Board Office to have typical picture mold, low wainscot, moulded trim and wainscot cap of oak. Provide for concealed radiator with hinged panels at sides. Galvanized iron work and registers will be set by the Heating and Ornamental Iron Contractors. Cabinets for coat closet and lavatory will be same as typical cabinet. See drawing No. 106.

(156) Appellate Court Room: Appellate Court Room to have moulded base and chair rail, typical wire mould and cornice, paneled wainscot in back of and at sides of Judges' bench and Judges' bench with sloping top, sawn brackets and paneled front (both sides) of oak. Provide 7/8-inch by 1½-inch nosing with 5/8-inch by 7/8-inch moulding ends of oak at edges of platform between back of Judges' bench and wall. See drawing No. 106.

(157) Elevators: Build elevator cages for two passenger elevators of paneled oak as detailed on drawing No. 103, with paneled ceiling and concealed trap door, oak ventilating grilles and leave ready for marble base.

(158) Hand Rails: On main stairs run a 3-inch by 3-inch moulded oak hand rail screwed to iron with rolls around newels of first floor. Fire stairs to have round oak hand rail 2¼ inches in diameter screwed to iron balustrade.

(159) Closets: Janitors' closets to have 12-inch shelves and hook strips on all terra cotta tile partitions or furring. All other closets to have 12-inch shelves and hook strips.

In all closets containing lavatories, all Justices' toilets fourth floor, Governor's toilet and Dean's toilet sixth floor, provide oak frames with stops for mirrors same as shown for cabinets.

(160) Thresholds: Place 5/8-inch by 4-inch beveled oak thresholds at all interior doors except where marble or tile floors meet marble or tile and at doors opening into fire stairs.

(161) Bench, Boiler Room: Furnish a work bench for boiler room constructed of Oregon pine as follows: Bench to be 3 feet 0 inches high, with top 2 feet 6 inches by 14 feet 0 inches by 1¾ inches; provide shelf 1 foot 6 inches above floor, 1¼ inch thick, extending full length and width of bench; provide four pairs of legs made of 4-inch by 4-inch, with 2-inch by 6-inch apron under top and 2-inch by 4-inch cross bars under shelf.

(162) Locker: Locker in boiler room to be 2 feet 0 inches wide, 5 feet 0 inches long and 7 feet 0 inches high, similar to typical cabinets, but constructed of 7/8-inch by 4-inch T. and G. Oregon pine. Provide one shelf 12 inches wide and length of cabinet with 7/8-inch by 5-inch rebated hook strip under on three sides. Door to be 1¼-inch single panel, 2 feet 0 inches wide.

(163) Screws: Window stops to be screwed on. All screws to be solid brass, round headed.

(164) Rough Hardware: Furnish and install all rough hardware such as nails, anchors, screws, pulleys, weights, sash chain, hangers for doors, etc.

(165) Finished Hardware: Another contractor will furnish all finishing hardware, and this Contractor to give receipt for and set same in place properly and be responsible for all hardware until final acceptance of building.

Hardware

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(166) Scope of Work: It is the intent of this specification and plans to care for the furnishing of all finished hardware from basement to roof and delivering same at building.

(167) Quality: Plate numbers are taken from Corbin's Catalogue for convenience, but equal hardware of other make will be accepted.

Contractor to submit samples when requested of each piece of hardware required on building to State Department of Engineering and remove same at his own expense.

All hardware to be factory made and no hardware made half locally and half factory to be accepted.

All exposed portions of finished hardware, unless otherwise specified, to be solid cast bronze metal of heavy pattern. Finish throughout to be statuary bronze, except toilet rooms, which will be heavy nickel plated on bronze metal.

All finished hardware, which is hereinafter specified to be of steel or cast iron, shall be heavily sheradized or electro-plated before it is bronze plated.

Submit a sample of bronze and bronze-plated cast iron to the State Department of Engineering and all hardware throughout to equal same.

(168) Butts: Except as below, butts for all interior, corridors, closets, communicating doors to be Corbin's 161½ with fibre washers 4 inches by 4 inches, three to each door. Butts for private toilet doors to be cast bronze 4 inches by 4 inches, three to each door, with fibre washers and equal in weight to Corbin's 61½.

Butts for metal-covered doors to be cast iron with fibre washers 4 inches by 4 inches, three to each door, and equal in weight to Corbin's 161½.

Butts for transoms over corridor and hall doors to be 3-inch by 3-inch steel, one pair to each transom.

Butts for corridor door transoms in toilets to be cast bronze, 3 inches by 3 inches, equal in weight to Corbin's 101½.

Butts for all wardrobe or cubby doors to be cast iron, with fibre washers 3 inches by 3 inches, one pair to each door, equal in weight to Corbin's 161.

Butts for all fourth story and other casement windows to be 4-inch by 3-inch cast bronze, with fibre washers, three to each sash, equal in weight to Corbin's 61½.

Butts for casement sash in toilets to be 4-inch by 3-inch cast bronze, with fibre washers, three to each sash, equal to Corbin's 61½.

Butts for slat doors in marble partitions to be 4-inch reverse spring, equal to Bommer No. 1000.

Left-hand interior double doors to have Rixson's Olive Knuckle butts to paint.

Main entrance doors to be hung on Rixson's D. A. checking floor hinge No. 30.

All doors in Governor's room and reception room to be hung on Rixson's S. A. checking floor hinge Nos. 8 and 9.

All double swing doors, other than main entrance doors, to be hung on Rixson's D. A. checking floor hinge No. 15.

(169) Bolts: All double doors to have flush lever bolts, top and bottom, on edge of stile of one leaf, equal to Corbin's No. 2859. Top bolt in each case shall be long enough to be easily operated from the floor.

All casement sash to be fastened with turnbuckle 78½ to suit detail and plain lever handle 3 inches long and ½ inch diameter.

Slat doors are to have bolts equal to Corbin's brass N. P. No. 157¼, with strikes for marble.

(170) Window Trim: All casement windows to have casement adjusters, one for each leaf, equal to Corbin's No. 44½ and 15 inches long.

Transoms to have cast brass transom catch and strike, equal to Corbin's No. 02276½.

All double hung windows to have bronze sash locks, equal to Corbin's No. 1831½, and two bar lifts to each lower sash, equal to Corbin's No. 9296.

(171) Locks: All doors not otherwise specified to have mortise knob locks or latches. Where latches are required to be operated from one side by a key only, they shall have a fixed knob on the other side. All knobs and cylinders must center in stiles of doors.

Three master keys and three keys to each lock shall be furnished for corridor doors, doors leading from corridor and vestibules to offices, closet doors, inner office doors and electric closets.

Janitor's closets and private offices to have office cylinder locks, equal to Corbin's No. 567, master keyed and grand master keyed as directed for different departments.

Connecting doors are to have locks with bolt each side, equal to Corbin's No. 155½, thumb pieces to be on oval plates to match knobs and roses.

All double swing doors, other than main entrance doors, to have dead locks equal to Corbin's No. 141.

Private toilet doors to have locks with thumb piece, same as for connecting doors; locks to be equal to Corbin's No. 159½. Doors from Justices' offices to alcoves to have latches equal to Corbin's No. 090. Main entrance doors to have locks equal to Corbin's No. 141.

Wash basin and closet doors to cubbies to have latches equal to Corbin's No. 045.

(172) Strikes: Strikes for all locks, except connecting doors and cubbies, to be protected box strikes. All strike plates shall be large enough to fully protect the finish.

(173) Knobs: Knobs throughout to be plain round cast design. Cubby doors to have knobs 1⅝ inches in diameter; all other knobs to be 2½ inches in diameter. All door locks to have knobs pinned to each end of spindle and not screwed; adjustment to be made with a wrench.

Roses for doors to be cast with design to match knobs and to be 2⅜ inches in diameter. Roses for cubby doors to be 3 inches by 1¼ inches, oval in shape to match door rose.

(174) Door Checks: Door checks are to be provided on one leaf of all pairs of doors leading from vestibules and corridor to offices, stair doors and toilet doors to general toilets. To be Rixson's No. 8 with cement case.

(175) Base Knobs: Base knobs are to be cast bronze with rubber tip, equal to Corbin's No. 365, and are to be furnished for all connecting, closet, and cubby doors.

(176) Coat Hooks: Coat and hat hooks are to be equal to Corbin's No. 1033. Provide six for each cubby and twelve for each closet.

Provide hooks with bumpers for all toilet slat doors, equal to Corbin's No. 2421.

Provide one solid brass hook equal to Corbin's No. 01034½ for each private toilet door.

(177) Transom Rods: Transom rods are to be equal to Corbin's No. 095 to suit conditions.

(178) Padlocks: Provide 10 padlocks for hinged grills over windows equal to Corbin's No. 2882¼.

(179) Push Plates: All double swing doors to have push plates equal to Corbin's No. 78090.

(180) Letter Box Plates: Provide letter box plates for corridor doors to offices as per Corbin's No. 78072.

(181) General: Before hardware is ordered, this Contractor shall examine drawings and full size details and be responsible for all misfit hardware ordered.

(182) Guarantee: This Contractor shall give to the State a written guarantee made upon the form included under the head of General Conditions, to fulfil the requirement that all hardware be free from defects and in perfect condition when delivered at the building. If during a period of two years after date of acceptance of building, trouble should occur due to original defects, the Contractor shall furnish and install new parts to completely remedy same at his own expense.

Metal Lath Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(183) Scope of Work: This specification and accompanying plans are intended to cover all metal furring and lathing for exterior walls, ceilings, forms for run and ornamental plaster, and ceiling supports not already provided, from first to sixth floor inclusive.

(184) Preparation for Furring: When forms are in for concrete fireproofing, this Contractor is to have placed in floor No. 8 galvanized wires, about four feet apart and four feet on centers for fastening ceilings. These wires to extend down to and hold up ceiling channels. Provide loops to hook over floor reinforcing on end imbedded in concrete.

(185) Furring: Furr ceilings of all floors, first to sixth inclusive, and basement lobby and toilet room. Build all forming for cornice and ceiling work for lobbies, vestibule and Supreme Court Room. Furr soffits of two main stairs from basement to top, and furr vaults for double ceiling with an air space between. All exterior walls of building to be furred on inside and around all windows.

All ceilings to be furred as follows: Run ¾-inch cold or hot drawn channels 4 feet on centers over all ceiling surfaces, giving supporting wires a double turn around channels, and at right angles to these run ¾-inch channels 12-inch centers, cross tie them together with 18-gauge galvanized wire wrapped twice around joints and fastened together with a double turn and bent back. All exterior walls furred with ¾-inch channels 12 inches center to center and stiffened with channel every 3 feet in height running at right angles to stud channel.

Make ceiling rigid with channel braces secured between floor slabs and furring where necessary. Wall ends of cornice forming to let into brick or tile walls.

All furring for ornamental ceilings and cornices to be bent to forms in accordance with full sized details so that no plastered surface will extend beyond furring more than 1¼ inches nor less than ½ inch.

Furr between ceiling and floor of elevator, light, stair and other shafts and stair soffits with ¾-inch channel, 12 inches on centers where necessary to connect floor and ceiling.

(186) Metal Lathing: Metal lath for all furred work shall be an expanded metal lath, 25 gauge, weighing not less than three (3) pounds net to the square yard and painted after expansion with best quality carbon paint. The metal must be of such quality that samples taken from the delivered material and tested in the standard acid test of the State Department of Engineering, applied to the bare metal, shall show a loss in weight not to exceed three (3) per cent. Two (2) one square

foot samples shall be taken by the Superintendent from separate sheets of the lath delivered to the building site and sent to the State Department of Engineering for testing. No lath shall be placed in the building until it is approved by the said Department according to the result of the test.

Metal lath shall be fastened to metal furring every six (6) inches with No. 20 gauge annealed tying wire carried around furring and lath, the ends being twisted tight with a double turn and bent back flush with face of lath. Edges of sheets of lath shall be lapped one (1) inch and secured every six (6) inches with No. 20 gauge annealed tying wire.

(187) Corner Beads: All plaster exterior corners to be protected with Union or other approved corner beads set straight and plumb, extending from floor to ceiling and securely fastened in place.

(188) Interior Partitions: All interior partitions are to be terra cotta tile and are not included in this contract.

(189) Scaffolding: In entrance vestibule and Supreme Court Room, a skeleton scaffolding will be built, but this Contractor to furnish all movable boards and furnish his own scaffold in all other rooms, corridors, etc., throughout.

(190) Plastering Specifications: This Contractor to read carefully the plasterers' specifications and work in conjunction with plastering contractor.

Plastering Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(191) Scope of Work: This specification and accompanying plans include plain and ornamental plastering of all wall and ceiling surfaces throughout building from first to sixth floors inclusive and such parts of basement shown on plans and hereinafter specified and to include all elevator shafts, stairwells, stair soffits, vaults, etc., shown on the various floors; and all exterior plastering of vestibule and imitation granite of rear elevation.

(192) General: This Contractor is to examine the scale drawings and details furnished and adapt his work to the existing conditions, taking all measurements at the building for ornamental work to verify the drawings, doing no work when discrepancies occur until adjustments are made by the State Department of Engineering, and then changing his work as required to meet such requirements. He is also to examine any separate drawings there may be for other work coming in conjunction with plaster work and arrange his work to meet the requirements of other mechanics. While every effort will be made to have work coming behind plasterer put in before plastering begins, this Contractor to leave openings, cut holes and do all patching without extra charge.

Plasterer before beginning to install his work shall examine and have made or make perfectly secure all furring, lathing or other backing for plaster work; no claim for defective foundation will be allowed unless claim is filed before this Contractor starts work.

(193) Protection: This Contractor is to protect all work in the building and replace at his own expense all work of any other contractor or person that may be damaged by this work.

(194) Models: Models in clay of all ornamental surfaces to be submitted to the State Department of Engineering for approval and changed as required to give desired result.

(195) Scaffold: This Contractor to provide all scaffolding of every kind needed for his work and furnish all necessary boards and ladders. Skeleton scaffold in Supreme Court Room and vestibule will be furnished and taken down by Carpenter.

(196) Mixing: Where mixing is done on different floors, watertight boxes must be used to prevent ceilings below from being stained, and where any stains occur this Contractor to cut same out and replaster.

(197) Sand: All sand to be one-half Keystone or River sand and half bank sand, free from all clay, sticks or other dirt.

(198) Cement: All cement used for exterior work to be Portland and in accordance with the Standard tests of the American Society for Testing Materials, as last amended.

All Keene's cement to be Best Brothers', American, Nephi or other approved Keene's cement.

(199) Lime: Lime to be fresh burned Santa Cruz Holmes "Diamond" Brand, or equal brand, guaranteed not to pop, slacked, screened and used as hereafter specified.

(200) Lime Putty: All lime putty to be slacked, screened and allowed to stand in putty box at least three weeks before using.

(201) Quality of Work: Entire building to have three coat work on metal lath and two coat work on brick, tile or concrete, with hard finish as follows:

The scratch coat to be composed of lime mortar, one part lime, six parts sand, and hair and fibre added to make a good bond, to which add, just before using, 200 pounds of Keene's cement to each cubic yard of mortar.

Second coat to be composed of one to six lime mortar gauged with 150 pounds of Keene's cement to a cubic yard of mortar. No gauged mortar that has laid overnight to be used. Final coat to be hard finish.

First coat shall be applied to lath in such a way as to firmly press mortar into keys and shall be well scratched in both directions before it has set. Second coat on lath and first coat on tile or brick when applied shall be made perfectly level and true by means of straight edge and left ready for hard finish.

Plastering shall extend behind all wood base, wainscoting, burlap and canvas panels, except large panel on north wall of Supreme Court Room and rooms that are paneled in wood to ceiling, to floor line, and under coats to be brought to within ⅛ inch of face of grounds. Ceilings over vaults to be double, with an air space between. See drawing No. 105.

(202) Hard Finish: All hard finish and run work to be plaster of paris and lime putty finish, thoroughly troweled and brushed to a true, hard polished finish, free from waves and flush with grounds. This coat shall not be applied until under coats are thoroughly dry, which are to be sprinkled with water to form damp surface.

(203) Run and Ornamental Work: All run work shall be made in strict accordance with full sized details and applied to the ceiling and walls with metal templates cut to form profile desired. All ornamental sections shall be cast from models approved by the State Department of Engineering and fastened in place with plaster of Paris. Ceiling of Supreme Court Room to be cast in sections and fastened to metal forms of ceiling with No. 16 copper wire, plaster of Paris and burlap.

Vaulted ceiling of entrance vestibule to have ornamental bands and rosettes of cast plaster with plaster vaults as shown on drawings Nos. 11 and 102.

All curved surfaces and groins to be accurately formed, using templates cut to the desired curves as guides for the work.

(204) **Basement:** Walls and ceilings of lobby, corridor, offices, toilets and where marked in basement to be plastered. Remainder of basement to be left unplastered. Lobby and public toilet ceilings to be furred, other ceilings to be plastered direct on concrete.

(205) **Background for Plaster:** All ceilings, exterior wall surfaces, stair soffits, well and skylight enclosures to be plastered on metal lath and partitions to be plastered on terra cotta tile, brick or concrete—on all floors, basement to top.

(206) **Cement Base:** All partitions around fire stairs to have cement base as shown on drawings Nos. 103 and 104. All plastered walls in basement, except in lobby and toilet rooms, to have a cement base 8 inches high. All cement base to be composed of 1 part Portland cement to 2½ parts sand troweled to a smooth and true finish.

(207) **Exterior Plaster:** Entire rear wall of building between granite returns at Polk and Larkin Street ends, including walls of rear wing to be cement plastered in imitation of granite as follows:

All concrete surfaces where applied imitation granite is specified to be thoroughly roughened and well hosed with water and immediately before base coat is applied to be treated with a cement wash brushed on.

The first or base coat shall be composed of 1 part Portland cement to 2½ parts of river sand and shall be applied with a steel trowel, ½ inch thick, and straightened and water floated to a true and even surface. Before this base coat has set, scratch same lightly in both directions with a steel scratcher sufficiently to form good key for finish coat. All moldings to be brought out with like materials in same manner to within ⅜ inch of finish line.

Before base coat is thoroughly dry, apply granite finish coat at least ⅜ inch thick, which will be composed of a composition of 2 parts of crushed granite quartz and marble dust and 1 part of white Portland cement with the addition of 2% Medusa waterproofing compound.

This finish coat to be applied evenly with wood floats and water floated free from waves or imperfections. All granite finish to be finally cleaned down with a solution of muriatic acid and must match in texture and color sample of genuine granite as selected by the State Department of Engineering.

All cornices and belt courses shall be run with metal templates, cut to form profiles as shown by full sized details. Carefully form all window sills and run edges of window jambs, window soffits, coping of walls and pilasters perfectly true. Pilaster caps to be cast with reinforcing of No. 20 gauge wire lath and securely anchored in place.

Fire walls over rear wing to be plastered one coat on the inside with cement plaster, 1 part cement to 2 parts sand, and floated to true, even surfaces.

(208) **Repairing:** Plaster Contractor must repair all defects or scratches in the plaster work after all other mechanics have completed their work and leave same in perfect condition to the satisfaction of the State Department of Engineering.

(209) Guarantee for Plaster Work: The Contractor shall give to the State a written guarantee, indorsed by the manufacturers of the material, that the exterior and interior plaster work, and Keene cement work will not crack, pop, check, spall, fall off or otherwise deteriorate for a period of two (2) years from date of the completion and acceptance of the building and the Contractor shall make good and repair or replace all defective work appearing during this period of time. He shall also repair all damage caused by the defects in the plaster above mentioned.

(210) Cleaning Up: This Contractor to clean dirt made by his men on each floor when he is finished with same and remove all plaster that has fallen on floor before same hardens.

Tile Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(211) Scope of Work: This specification and accompanying plans are intended to cover the furnishing and setting of all tile work throughout building and all work marked tile on plans and not specified, or specified and not marked on plans to be considered as part of this contract. Cork tile is included in this contract.

(212) Cement: All cement used shall be Portland and in accordance with the Standard tests of the American Society for Testing Materials, as last amended.

(213) Gravel: Gravel, if used, shall be composed of clean pebbles free from sticks and other foreign matter, containing no clay or other material adhering to it. Three per cent of dirt will cause rejection of gravel.

(214) Sand: Sand to be clean, with coarse grains predominating. It is to be free from loam, sticks, organic matter and other impurities, three per cent of which will cause rejection.

(215) Cement Mortar: All wall surfaces of tile to be laid in plaster composed as follows: 1 part lime to 8 parts sand, and just before using add 1 part of cement to 3 of the above mixture, all mortar to be mixed on job and measured in bottomless boxes.

(216) Cutting, Etc.: All cutting and drilling of tile necessary for pipes, bolts, etc., for all other workmen to be done by this Contractor. Measurements to be taken at building by Contractor for the proper fitting and setting of work.

(217) Quality: All wall tile to be first quality, 3 inches by 6 inches, except where otherwise specified, free from cracks, set with cove cap to plaster and cove at bottom, laid perfectly true and straight, with joints in alignment, and to be American Encaustic Tile, or equal, guaranteed for one year not to craze. All floor tile to be 1-inch white ceramic hexagons. All must be first quality.

(218) Floors for Tiling: All floors specified to be tiled, except for cork tile, will be delivered to this Contractor 2 inches below finished floor, which must be filled with concrete composed of one part cement and five parts aggregate, upon which lay the tile in cement and sand 1 to 2, keeping joints straight and true. All floors to be perfectly level except where shown graded to outlets and in men's toilets, where floors will grade to urinals.

(219) Grouting: All floor tile to be grouted with cement, sand and water.

(220) **Amount of Work:** All public men's and women's toilet rooms, basement lobby, lunch room first floor, coat rooms, entrances to public toilets—basement to sixth floor—and toilet rooms off Supreme Court Room to have tile floors. All private toilet rooms, that is toilet rooms without marble stall partitions, and janitors' closets basement to sixth floor inclusive, to have tile floors and tile wainscot 4 feet high. Where noted on plans, closets containing lavatories to have tile floors and tile wainscots 4 feet high. In all public toilets tile to run from floor to 6 feet high, with cover cap to wall and tile returns to windows.

(221) **Tile Plinths:** In all rooms where tile wainscot is called for, furnish and set 5 by 7 white glazed tile plinths for all doors. See carpenter and marble specifications in regard to thresholds.

(222) **Tile Base:** Public toilet in basement to have a 6-inch tile base with cove to floor and bull-nose to plaster. All other toilets to have tile cove between wall and floor tile.

(223) **Cork Tile:** The floor of the Supreme Court Room to be cork tile, including tops of all platforms, treads of all steps, floor in back of Judges' bench and floor in vestibule.

All cork tile to be "Nonpareil" or equal, made only of first quality clear cork shavings, compressed solidly in closed moulds and thoroughly baked. All cork tile shall be set with elastic waterproof cement, which hermetically seals and binds all joints. Tile to be 9 inches by 9 inches by ½ inch thick, color to be selected by the State Department of Engineering.

(224) **Cleaning Tile:** On completion this Contractor to clean all tile work with acid and water and be responsible for damage caused to nickel plated work and other work, and leave same in perfect condition on completion of building. All crazed and stained tile to be taken out and replaced.

(225) **Background:** Outside walls to be metal lath, all partitions to be terra cotta, all furnished in place by other contractors. This Contractor to see that floors are left at proper height to finish his work flush with corridor floors.

Marble Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(226) Scope of Work: These specifications and accompanying plans are intended to cover all furnishing and setting of interior and exterior marble work throughout building.

(227) Cement: All cement used to be Portland and in accordance with the Standard tests of the American Society for Testing Materials, as last amended.

(228) Sand: Sand to be clean river sand with coarse grains predominating. To be free from loam, sticks, organic matter and all other impurities.

(229) Gravel: Gravel shall be composed of clean pebbles, free from sticks and other foreign matter, containing no clay or other material adhering in such a manner that it cannot likely be brushed off with the hand or removed by dipping in water. Three per cent of impurities will cause rejection.

(230) Concrete for Floors: Concrete filling for floors to be composed of one part cement, one of sand and five of gravel. All floors to receive marble will be kept 2 inches below finished flooring. Before setting floor tile, sprinkle cement under entire bed and tap into place.

(231) Grouting: All floor tile grouted with White Stainless cement and clean water.

(232) Samples: Samples of marble to be used are to be furnished when called for by the State Department of Engineering, and that used in building must equal samples submitted in every respect.

(233) Cutting, Etc.: Do all cutting and drilling for pipes, heating registers, electric and telephone outlets, bolts, etc., for all work coming in connection with marble.

Take all measurements at building for proper fitting and setting of this work and be responsible for same.

Make all joints of wall marble, close with plaster of Paris and run smooth and true in perfect alignment, securely fastened together and to walls with requisite copper anchors, clamps, dowel pins, etc.

(234) Models: This Contractor to furnish plaster or clay models of all ornament for approval of the State Department of Engineering before any carving is commenced.

(235) Carving: All carving is to strictly follow approved models and detail drawings and is to be of uniform quality, with sharp, well defined edges, lines, etc., executed by experienced carvers.

(236) Finish: Floor tiling, door saddles, treads and platforms of stairs to be hone finished. All other surfaces to be highly polished in best manner with red grit, then with blue grit and finally with French putty powder, unless otherwise particularly specified. No marble less than ⅞ inch thick will be accepted. All base, etc., to have top edge polished.

All surfaces to be free from defects and no patching or filling will be permitted except in fancy marbles.

Veining to be uniform and all in one general direction.

(237) Entrance Vestibule: Jib panels in lunettes of Entrance Vestibule and all round discs of same to be Levanto marble.

(238) Main Lobby: Main Lobby walls to be Columbia, finished with a sand or honed finish, laid with joints as shown. All pilasters to be solid and fluted as shown, and all corner pieces to be cut from solid piece. Base and borders of Vestibule to be blue Belgium marble and floor panels to be Columbia in design as shown.

Walls of main stairways, basement to second floor landing, to be lined with same marble as Lobby.

(239) Corridors First to Sixth Floor: All public corridors, first to sixth, and elevator lobbies, second to sixth floor inclusive, to have floor and base of Italian or Columbia marble, laid in design as shown. Marble to run into door jambs to doors. Base to be 8 inches high and to return in jambs to doors as shown, forming plinths. All private corridors to have 8-inch marble base and border and terrazzo centers. All terrazzo to be made with cement and white marble clips and machine rubbed to a smooth surface.

(240) Hardware: This Contractor to furnish and set all nickel plated cast brass legs, rails, rail supports, angles, nuts, brackets, etc., to properly support marble, and set toilet door hardware when furnished. See drawing No. 103.

(241) Thresholds: Furnish thresholds of same marbles specified for floor at all main entrance doors, at interior doors to all toilet rooms, at doors leading from corridors to stairways each floor and wherever tile and marble come together, same to set ⅝ inch above floor and to be 4 inches wide. Wood thresholds will be set by Carpenter wherever marble butts against linoleum covered floors at doors of private toilet rooms.

(242) Toilet Rooms: Toilet rooms where marble partition stalls are shown, basement to sixth floor inclusive, will have 6-foot tile wainscoting and marble trim to doors to coat room or corridors—same to be 5 inches wide by ⅞ inch thick. Tile set by another contractor.

All partitions for toilet stalls and janitors' closets in toilet rooms to be ⅞ inch thick. Door stiles to be 1¼ inches thick, set on N. P. cast brass legs 10 inches above floor for toilet stalls—all of Columbia marble. Top of partitions to be 6 feet 0 inches above floor. Partitions and door stiles of janitors' closets to run to floor. All coat rooms, lunch room, basement lobby and small halls between toilet rooms and main corridor to have 8-inch Columbia marble base.

(243) Elevators: Set a base of black Belgium marble in two elevator cages 12 inches high, as shown on drawing No. 103.

(244) Stairs: Two main stairways, one from basement to sixth floor and one from basement to landing above sixth floor, to have "Italian" or "Columbia" marble treads 1¼ inches thick as shown on drawing No. 1009, and "Italian" or "Columbia" marble platforms in designs as shown, with nosings 1¼ inches thick and 12 inches wide. Treads at first floor newels to be curved as shown on drawing No. 1008. Set an 8-inch base of Columbia or white Italian marble on top of all iron wall strings and around all platforms, beginning at second story platforms and extending to top of stairs. All strings and risers will be iron furnished by the Ornamental Iron Contractor.

Steps in ante room adjacent to Supreme Court Room fourth floor to be Columbia marble with 1¼-inch treads, ⅞-inch risers and buttresses built up of ⅞-inch pieces, as shown on drawing No. 105.

Other stairways shown to have concrete or iron treads and risers and are not included.

(245) Cleaning Marble: On completion of building, this Contractor shall rub up and clean all marble work and leave same in perfect condition.

Roofing Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(246) Scope of Work: The furnishing and setting of slate for main roof and composition roof for wing in rear and over elevator house and dormers shall be included under this work.

(247) Slate Roof: Main roof and sides of dormers and roof houses to be covered with No. 1 blue black slate, a sample of which must be submitted for approval, and all slate used on roof must equal color of sample submitted.

All slate to be standard quarry thickness and 12 inches wide by 24 inches in length, and laid in courses with a 10½-inch exposure to weather.

(248) Laying Slate Roof: All slate to be properly punched and laid with 3-inch lap. Each slate to be secured with two 3d. flat-headed copper nails. Eaves and ridges to be doubled and wherever necessary make proper flashing with slaters' cement.

All slate to be laid in workmanlike manner and all slate to break joints with the adjoining row.

(249) Guarantee for Slate Roof: This Contractor shall give to the State a written guarantee, made upon the form included under head of General Conditions, to fulfil the requirement that the slate roof and walls of dormers will not leak for a period of ten years from date of completion and acceptance of building. Any leakage of rainwater or other defects appearing during this period of time and the damage caused thereby shall be repaired by this Contractor at his expense.

(250) Composition Roofing: Composition roofing shall be laid over the surfaces of the flat roofs.

Materials: Felt shall be best quality saturated roofing rag felt weighing not less than 14 pounds per 100 square feet net. It shall contain not more than 45 per cent of felt by weight and at least 55 per cent of the total weight shall be saturation.

Roofing cement shall have a melting point of not less than 150 degrees Fahrenheit and a penetration of not less than 30.

Gravel shall be clean, dry pebbles of such size that all will pass through a ¾-inch mesh screen and be retained on a ⅜-inch mesh screen.

As required by the State Department of Engineering, samples of each material delivered to the building site shall be taken by the Superintendent and sent to the said Department for testing. No materials shall be placed until samples of same have been tested and approved by the State Department of Engineering. All materials not passing the test will be rejected and no such rejected materials shall be used in

part of this work, but shall be removed at once from the building site by the Contractor. Samples of dry sheet and felt shall be 1½ yards long and full width of roll. Samples of roofing cement shall be 1 quart. Samples of gravel shall be ½ cubic foot.

(251) Laying Composition Roof: Sprinkle slab with asphalt while hot. Lay two plies saturated felt, weighing 14 pounds per 100 square feet, lapped 17 inches over preceding layer.

Coat the entire surface with roofing cement and follow with three plies of felt, each lap to lie about 22 inches, so that no part will touch felt. Then coat the entire surface with asphalt and while hot imbed not less than 400 pounds of gravel to 100 square feet. Gravel to be dry. All loose gravel to be swept off.

(252) Flashing: All roofing felt to run 6 inches up side of wall and around side of all projections and coated as specified for roof. All corners and projections through roof to be reinforced with a 6-inch wide strip of flax felt well saturated.

(253) Guarantee for Composition Roofing: This Contractor shall give to the State a written guarantee, made upon the form included under head of "General Conditions," to fulfil the requirement that the composition roofing will not leak for a period of ten years from date of completion and acceptance of building. Any leakage of rainwater, roofing cement through dry sheet or other defect appearing during this period of time, and the damage caused thereby, shall be repaired by this Contractor at his expense.

Ornamental Ironwork

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(254) Scope of Work: This specification covers furnishing and setting up in a most complete manner all work specified herein, and all beams, angles, tees, channels, panel work, brackets, bolts, rivets, anchors, etc., not shown on steel plans, necessary to a thorough and artistic job. This specification does not cover any slate or marble work coming in connection with the stairs, but all other work necessary to the completion of this work to be furnished and set by this Contractor.

(255) Cast Iron: All cast iron to be best quality, equal to best machine castings, smooth, even, straight, clean and sharp, and all rough parts must be filed smooth and true, and all to conform strictly with full sized details.

(256) Wrought Iron: All wrought iron for railings, grilles, stairways, etc., to be best workmanship, of generous size and carefully put together as detailed.

(257) Models: Plaster models of all ornament to be submitted to the State Department of Engineering before casting.

(258) Painting: All ironwork not galvanized to receive one coat of red lead and oil or black paint as directed by the State Department of Engineering—to be done at the shop.

(259) Measurements: The Contractor to take all measurements at building and be responsible therefor.

(260) Flag Pole Sockets: Provide Concrete Contractor with two cast iron sockets for large flag poles, same to be 16½ inches by 16½ inches inside by ¾ inch by 9 feet 0 inches.

Provide and secure in place three cast iron sockets for flag poles over balcony as detailed on drawing No. 101.

(261) Flag Pole Braces: Provide and set in place braces for three flag poles over balconies, to consist of wrought iron rods with turn buckles anchored to steel frame and with collars around poles as detailed on drawing No. 101.

(262) Ceiling Light Frame: Furnish and set a steel frame for ceiling light over Supreme Court Room with connections and members as shown on drawings Nos. 105 and 107. Drill holes in structural 10-inch beam over ceiling light for hanger connection; two hangers being required. The steel plates forming ribs of ceiling light are to have ¼-inch holes, 12 inches on centers, for securing woodwork to

same; and plates are to be imbedded 6 inches in concrete at outside ends so that frame must be set before concrete is poured.

(263) Screens Elevator Shafts: Provide and set under elevator machinery wire screens in iron frames anchored to structural frame as shown on drawing No. 105. Same to be 2-inch mesh capable of supporting a load of 300 pounds at any point of span and covered with No. 20 gauge ½-inch mesh screen on top, as per requirements of the Industrial Accident Commission.

At the bottoms of all counterweight guides in elevator shafts provide and install substantial metal enclosures around counterweight at least 7 feet high, with hinged front in accordance with the rules of the Industrial Accident Commission.

(264) Iron Ladders: Provide and securely set in place iron ladders in two vent shafts adjoining Supreme Court Room (24 feet long each) and from attic to roof of rear wing, same to have 2-inch by ¾-inch side bars and rungs ¾ inch in diameter, 12 inches on centers.

(265) Window Grilles: Furnish and hang hinged wrought iron grilles at all first story windows on north elevation of rear wing, grilles to have ⅝-inch square vertical bars about 3½ inches center to center, and three horizontal bars 1½ inches by ½ inch, with eye set in masonry to form pivots on one side and for padlocking on opposite jamb. Parts built in brickwork to be furnished bricklayers with dimensions for locating same.

(266) Flag Pole Bases: Furnish and set ornamental cast iron bases for two large flag poles in front of building, all joints to be horizontal, arranged so as to be concealed. No vertical joints will be allowed, so that base will have to be set before poles or dropped over top of same. No metal of above casting to be less than ½ inch thick.

(267) Cast Iron Window Grilles: Furnish and set two ornamental cast iron grilles over third story windows at end of Entrance Vestibule, same to be fixed in place with anchors let in terra cotta jambs.

(268) Steel Sash: All windows of boiler room to have "Fenestra" or equal steel sash as shown, with ventilators, one to each window opening. Steel door on east side shall be similar construction.

(269) Cast Iron Grilles: Furnish and set complete, ornamental cast iron grilles in Entrance Vestibule, Main Lobby and Supreme Court Room.

(270) Register Faces: Furnish and set the following brass plated register faces, to be of plain lattice design, ⅞-inch mesh, and to have controlling valves where so noted:

First floor, Hearing Rooms:

Two register faces, 12 inches by 30 inches, valved.
Two register faces, 14 inches by 20 inches, valved.

Second floor, Governor's Rooms:

Two register faces, 20 inches by 24 inches.
Four register faces, 3 inches by 24 inches.
One register face, 16 inches by 28 inches.
One register face, 18 inches by 27 inches.

Fourth floor, Supreme Court Room:

Eight register faces, 10 inches by 18 inches.

Appellate Court Room:

One register face, 6 inches by 30 inches, valved.
One register face, 12 inches by 14 inches, valved.

Sixth floor, Class Rooms:

Two register faces, 12 inches by 14 inches, valved.
Two register faces, 10 inches by 20 inches, valved.
One register face, 10 inches by 12 inches, valved.
One register face, 14 inches by 16 inches, valved.

(271) **Elevator Fronts:** Furnish and set all elevator fronts from basement to sixth floor inclusive; only two of the four elevators being run to basement. All elevator fronts to have frames built up of steel channels and angles with grooved cast iron sills as shown on drawing No. 1005. Frames to be securely fastened to structural steel work. Doors to be built up of wrought iron, first story doors being of special design and doors for all other floors typical. All ornamental parts of fronts and doors to be cast iron secured to steel and wrought iron work with screws, which are to be concealed or countersunk when not spaced to form part of the design. All glass stops to be cast iron or wrought iron fastened with round head or countersunk screws as shown. Doors to be hung on two-speed roller or ball bearing hangers, designed to carry door from 200 to 300 pounds each as manufactured by the McCabe Hanger Manufacturing Company, Elevator Supply and Repair Company or the Richard-Willcox Manufacturing Company, or equal. Hangers are to be securely fastened to channel beams with angle iron brackets. Provide rubber bumpers for all doors where they strike jambs and stops at back of pockets. All elevator doors shall have an approved noiseless bar lock, having outside key at first story.

(272) **Stairs:** This Contractor to furnish and set all ornamental ironwork, steel strings, connections, etc., for the two main staircases from basement to sixth floor, including flight from sixth floor to landing just below attic floor as shown on small scale drawings and full sized drawings Nos. 108 and 109.

All newel posts, risers and balusters and ornamental parts to be cast iron. Face strings to be cast iron, with ornamented mouldings and lugs to support ends of treads and risers cast on. Cast iron risers to be secured to same with countersunk screws. Wall strings to be 12-inch steel channels set so that marble walls of lower stories will cover same and in upper stories to take marble base, which is carried around stairs. Provide angle supports for ends of marble treads on wall strings. All strings to be securely fastened to structural frame. The

iron bar over the tops of the balusters to have ¼-inch countersunk holes drilled 12 inches on centers so that wood hand railing may be screwed to same. All treads and platforms will be marble set by another contractor. Wood hand rail to be set and furnished by Carpenter Contractor.

The two fire-escape stairways to have cast iron newel posts, cast iron or wrought iron balustrades and railings across backs of landings furnished and set by this Contractor. Newel posts to be 3¾ inches by 3¾ inches, with chamfered corners and moulded top. Balusters to be ½ inch square in section with ½-inch by ¾-inch top and bottom bars. Top bar to have ¼-inch countersunk holes 12 inches on centers so that Carpenter can screw wood hand rail to same.

The two staircases from fourth floor to store rooms adjacent to the Supreme Court Room on the fifth floor to be furnished and placed by this Contractor. Strings to be 10-inch steel channels with necessary connections and supports, risers to be ⅛-inch wrought iron plates, treads to be cast iron checkered plate with lip over risers. Railing to be 1¼-inch wrought iron pipe, with top and intermediate railings, stanchions about 4 feet 0 inches on centers and all necessary connections and flanges.

(273) Mail Chute: Contractor to furnish and erect one U. S. Mail chute of standard type; front fittings and all parts on first floor to be of bronze; steel chute channel to have rustless black enameled finish. On remaining floors, front fittings and parts to be finished in electroplated bronze, with steel chute channel in rustless black enamel finish. Provide one U. S. Mail box, solid bronze, size 33 inches by 21 inches by 9½ inches, design No. 1635 of the Cutler Mail Chute Company, or equal, in Main Lobby.

Contractor to prepare building to receive the mailing installation by furnishing and erecting framework consisting of 2-inch by 2-inch by ¼-inch steel angles, extending from the top of the mail box as may be necessary, to a point 4 feet 10 inches above the finished floor on the sixth story.

The preparatory work of the first floor to be bronze finish. All other floors to be painted rustless black enameled finish.

(274) Pipe Railings: Furnish and set 1¼-inch pipe railing around concrete platform for tanks in the attic space with top rail, stanchions about 6 feet 0 inches on center and all necessary fittings, flanges, expansion bolts, etc.

Provide similar pipe railing in Boiler Room as shown on plans, with top and intermediate rails. Also provide pipe railings as shown on retaining walls at rear of building.

(275) Iron Guards Elevator Cages: Provide and set ¼-inch by ⅞-inch wrought iron guard strips around openings in elevator cages with countersunk screws. Strips to be set after galvanized iron outside covering has been put on by another contractor so as to cover edges of same.

(276) Fireproof Vault Fronts: This Contractor to furnish and set two fireproof vault fronts with clear opening through vestibule at least 30 inches wide, 77 inches high and 20 inches deep; constructed as follows: Sides and top of vestibule to be No. 16 sheet steel; bottoms ⅛-inch sheet steel. The front frame to be framed with 3⅞-inch by 3/16-inch open hearth steel bars riveted at bottom into 2½-inch by ¼-inch sill bars and fastened at the top by bar clips. Securely fasten to this frame 1-inch by 5/16-inch filling bars. To the filling bars rivet 1½-inch by 1½-inch by 3/16-inch open hearth steel angles; bars being placed so as to form a groove between the outside frame and angles to receive tenon on back of the door. The rear frame to be made of 1¼-inch by 1¼-inch by 3/16-inch open hearth angles riveted to vestibule with removable bars of open hearth steel 4 inches by 3/16 inch fastened to angles to hold vault fronts in position.

The outer door plate to be made of 3/16-inch open hearth steel reinforced on sides, top and bottom by 2-inch by 2-inch by 3/16-inch angles, making the door ⅜ inch thick on edge. The hinges to be steel pin, ball bearing hinges riveted to the doors and jamb with nickel plated hinge tips. Outer doors to be equipped with eight locking bolts 1 inch in diameter, operating through an angle bolt frame, four to be placed vertically and four horizontally. The horizontal bolts are to project behind the door frame at rear of door when closed, so as to form 12 locking points. Bolt work to be thrown by nickel plated lever handle with hard rubber grip and checked with four tumbler combination lock, exposed parts of which are to be nickel plated.

The inside vestibule doors to be made of 3/16-inch open hearth steel hung on steel pin hinges riveted to doors and sides of vestibule, so as to swing into vestibule. Inside doors to be reinforced with 2-inch by 3/16-inch bars riveted on the back and arranged so that the bar on the right door will overlap the left hand door. Right hand door to be locked by up and down flat bolts, operated by nickel plated tee handle and checked by key lock.

(277) Pipe Supports: Provide pieces of 2-inch galvanized iron pipe to be imbedded in concrete over manholes in furred spaces behind elevator shafts for block and tackle. See drawing No. 105.

Sheet Metal Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(278) Scope of Work: This specification with accompanying drawings is intended to cover all materials and labor necessary to complete the miscellaneous sheet metal work of building as shown on plans or as herein specified. Take all measurements at building and be responsible therefor.

The work in general consists of gutter work, ridge roll, skylight work, flashing and conductors, metal sash and frames and metal covered doors. Steel sash in Boiler Room not included.

(279) Galvanized Iron: Except as shown or specified, all sheet metal work used in this work shall be one of the following alternatives:

(a) The metal composing the sheets shall contain 99.84% pure iron. The following elements are considered to be impurities: carbon, manganese, silicon, copper, sulphur, phosphorus, oxygen, nitrogen and hydrogen.

(b) The material composing the sheets shall be of a high quality of steel, the impurities in which shall not be present in greater quantities than as follows:

Carbon not more than	.12%
Manganese	.45%
Sulphur	.05%
Phosphorus	.04%
Silicon	.01%
Copper	.30% nor less than .20%

The sheets of metal before galvanizing shall be smooth and free from blisters, seams and pits. The galvanizing shall consist of not less than 1½ ounces of prime spelter per square foot of metal (two surfaces), uniformly distributed. It shall be applied in such manner that the spelter will not peel off during fabrication, transportation or installation, and any uncoated spots due to poor workmanship, rough handling, or any other reason shall be sufficient cause for rejection. The amount of spelter per square foot will be determined by the lead acetate method upon samples taken from delivery. Two twelve-inch samples of each gauge of metal shall be taken by the Superintendent from the material delivered at the building site and sent to the State Department of Engineering for testing and approval before any of this metal is installed in the work.

(280) Copper: All sheet copper used in this work to be not lighter than 16 ounces to the square foot, and shall be cold rolled except when soft copper is called for. All nails and rivets in connection with copper work shall be copper. Seams in copper work when so required shall be tinned, locked and soaked with solder.

No copper and galvanized iron to come in contact and where necessary connections between same to be made with lead weighing not less than 3 pounds per square foot.

(281) Skylights: All skylights to be of the puttyless type and no materials other than metal and glass to be used in their construction. The following description of material to be used is based on using the Nonpareil Puttyless Skylights.

Any skylight which in the opinion of the State Department of Engineering is equal to the above mentioned skylight, will be accepted.

The lower portion of all skylight bars to be constructed of No. 16 gauge metal, and the upper section of No. 22 gauge.

The bearing for the glass on the bar shall be of lead with two upstanding walls so as to conform absolutely to the irregular profile of the glass and render the joint between the glass and the bar both water and air tight. These lead cushions shall be detachable and reversible, so that they can be applied after the field labor on the frame is completed. The skylight caps to be constructed of No. 26 gauge metal with lead flanges grooved into the caps on both sides. The ends of the lead caps to be closed with malleable iron, lead-coated clips riveted to the bar to prevent the glass from sliding. All skylight bars to be thoroughly riveted to the frame at the intersection of the curbs, ridge and hips.

Cross gutterings to be made of No. 26 gauge metal and the ends flanged so as to insure all water from same dropping into the main condensation gutter.

All exposed bolts and nuts shall be made from cold drawn brass and the caps under the nuts shall be burred up to form a flashing of water-tight joint between the cap and the nut.

On all skylights, place a galvanized iron ventilator full length of ridge as shown on drawings Nos. 104 and 105.

Skylight frame to extend down over curb and form counterflashing and unexposed surfaces to be painted with two coats of red lead or other metal paint.

(282) Flag Pole Flashing: Flash around three flag poles over balcony with copper, all seams to be double locked. Copper to be caulked into stone reglets with lead so as to form a water-tight flush joint. Top of flashing to be tacked to flag poles with copper tacks to form a tight joint. See drawing No. 101.

(283) Gutters: All gutters to be lined with soft copper with double locked water-tight seams. Copper to extend 10 inches under roofing slate and to be caulked into stone reglets with lead. Where concrete gutters occur, the copper lining is to be turned over the edge and secured in place. All gutter linings to have 4-pound lead sleeves turned down 6 inches into heads of all leaders. See drawings Nos. 100 and 104.

(284) Ridge Roll: Ridge roll to be made of crimped copper sheets with double locked seams over wood frame, which shall be furnished by the Carpenter Contractor and securely fastened to same and roof sheathing.

(285) **Cornice of Dormers:** Dormers to have moulded copper cornice with copper extending 6 inches under felt of asphalt and gravel roof, with lip to restrain gravel.

(286) **Top of Smokestack:** Smokestack to have moulded copper top over an iron frame, as shown on drawing No. 104, so arranged as to form a slip joint with the steel stack. This Contractor to furnish bolts for building in concrete to anchor top in place.

(287) **Outlet Boxes:** Outlet boxes in asphalt and gravel roofs to be copper, 16 inches by 16 inches by 6 inches, and to extend 8 inches under felt on all sides. Provide a perforated copper lip to restrain gravel around top of outlet boxes and copper thimbles extending 6 inches down into heads of leader pipes.

(288) **Strainers:** Provide globe strainers over all leader heads to be set in loose. Strainers to be made of No. 16 copper wire, ½-inch mesh.

(289) **Elevator Cages:** The two wooden elevator cages to have all wood surfaces exposed to elevator shafts covered with 28-gauge galvanized iron as required by the rules of the Industrial Accident Commission. See drawing No. 103.

(290) **Flashing:** Furnish and set copper counterflashing for all tar and gravel and slate roofs and all projections through roofs, including portions of roof house and dormers which project through roof; and after counterflashing is set, this Contractor to fasten same in place with metal and cement up with one to two cement and sand the entire reglet. All flashing to be continuous and double locked together and set into the masonry at least 2 inches. Properly flash between slate roof, dormers and roof houses with copper shingles before counterflashing is set.

(291) **Metal Windows:** Windows of all elevator shafts and two fire-escape stairways from basement to top to be Underwriters' label galvanized iron frames and sash, set up complete.

(292) **Metal Covered Windows:** Windows in dormers to have sash and frames covered with galvanized iron.

(293) **Louvered Sash:** Provide and install louvered panels in two lower sash on fifth floor for exhaust and intake to Supreme Court Room as shown on drawings. Louvers to be made of galvanized iron with galvanized iron frame, so that they may be fastened in wood sash. Provide removable bronze screen (14 mesh) in metal frame behind louvers.

(294) **Galvanized Iron Doors:** Make two galvanized iron doors and frames with wire screen panels as shown on drawing No. 105 and set same in openings to pipe spaces behind elevators in attic.

(295) **Metal Covered Doors:** Cover all doors, where marked "Metal Covered" on the plans, with galvanized iron, including outside frames and plain casings for all of these doors and leave all satisfactory. Carpenter will hang the doors.

(297) Hollow Metal Doors: All doors opening into or out of Fire Escape Stairways and Boiler Room, door from landing above sixth floor to attic stairs and door opening into elevator shaft in Basement Lobby to be hollow metal doors with metal jambs and trim, constructed as follows:

All kalomine shall be best quality, soft annealed sheets, free from all buckle and having a smooth surface. On all panels, it shall be No. 24 gauge; on all rails and stiles of doors and on door frames and casings, it shall be No. 26 gauge; on all other work, No. 28 gauge.

All wood shall be best quality No. 1 "Clear," straight or vertical grain, thoroughly seasoned and kiln-dried Oregon pine.

All rough stuff shall be best quality, fine grade and specially made for the finest grade of metal work.

All sheets shall be rolled and re-rolled until entirely free from all buckle.

Metal shall be drawn over wood cores by machines and be clamped at all edges and ends. All flat surfaces over 4 inches wide shall be cemented to the wood cores at time of going through machine and shall be placed under hydraulic pressure until cement has set, or for at least 24 hours. No work will be accepted where metal does not lie tightly on wood cores, or where edges and ends are not tightly clamped.

Doors are to be glued and doweled with hardwood dowels after metal is drawn on cores.

Panels are to be covered full depth of rabbet in rails and stiles. This metal is not to be drawn on cores but is to be cemented and put under pressure, as specified above.

All door joints must be thoroughly soldered and finished smooth.

All mouldings shall conform to full-size details. All edges must be straight and true, and all corners sharp and square. All surfaces must be free from blisters, cracks, rough edges, or loose places.

All work must be blind-nailed wherever possible, and where this is impractical, nails must be countersunk and covered with "Rough Stuff" finish smooth and flush with metal. Nails must not be driven far enough to let go of metal.

Kalomine frame shall be nailed to rough bucks. All doors must hang true and plumb and frames must have all angles right angles.

All work both at the shop and in the field must be done by men experienced in Kalomine work. Care must be taken in applying all hardware to cut metal and to turn it in under hardware. No work of any sort which shows the raw edge of metal will be accepted.

All door frames to have solid stops.

Hardware will be furnished at mill or at site by another contractor. The Contractor for Kalomine work shall receive, care for and be responsible for all hardware and install same.

All miters and cracks shall be filled with Rough Stuff and sandpapered smooth.

Each piece of work shall be covered with one piece of metal. Where mouldings are longer than 10 feet, the lapping metal shall be

cut out, the joint butted and reinforced with a piece of metal underneath. No joint must show in the finished piece.

All Kalomine work shall receive one (1) coat of pure white lead and oil paint on all surfaces immediately after being run.

All surfaces which show shall be grained and finished with three coats of varnish in imitation of wood finish adjoining work at building.

(298) Guarantee: This Contractor shall give to the State a written guarantee, made upon the form included under head of General Conditions, to fulfil the requirement that the sheet metal work, including the metal roofing, will not leak for a period of five years from date of completion and acceptance of building. Any leak or defect appearing during this period of time, and the damage caused thereby, shall be repaired by this Contractor at his expense.

Glass and Glazing Work

Note—Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(299) Scope of Work: Work to include all glass of entire exterior windows and doors and interior partitions and doors, all skylights, elevator fronts, etc., shown on plans or specified.

(300) Plate Glass: All windows of street elevations, except rear street and court walls, first to top and except where otherwise specified, entrance doors and all division partitions between entrance vestibule and first, second and third story lobbies and all interior partitions or doors marked clear to be ¼-inch best American Plate Glass, free from defects and blow holes, and set in putty with wood stops or metal mouldings.

(301) Obscure Wire Glass: Glass of all skylights, vent shafts, all windows in elevator shafts, metal windows on fire stairways at each end of building, basement to top, and glass of Boiler Room basement to be obscure wire glass, set in metal frames and well puttied. All wire glass set with strands running vertically or long way of pane.

(302) Sheet Glass: All glass of basement, rear street and court walls and wherever shown and not otherwise specified to be best American Sheet Glass, 26 ounce, free from blow holes and other defects.

(303) Wire Plate: All glass for elevator doors and partitions, basement to top, and doors to fire stairways to be wire plate set in putty with metal stops. All wire glass set with strands running vertically or long way of pane.

(304) Obscure Glass: All glass of vent windows, windows main stairs to light court and all interior partitions and doors not marked clear on plans to be obscure moss glass.

Court room ceiling light to be glazed with light amber cathedral glass.

(305) Mirrors: Over all lavatories except in public toilets and toilets adjoining the Supreme Court Room, this Contractor is to furnish and set plain plate glass mirrors, 16 inches by 24 inches, as shown on drawing No. 1004; all wood frames and stops being furnished and fitted by the Carpenter.

(306) Setting: No glass to be set until after plastering is finished; set and bed in putty, using colored putty where necessary to match wood. All plate glass and obscure to be set with wood or metal stops as shown. Skylight and metal window glass to be set in putty with metal frames.

(307) General: This Contractor to be responsible for all glass in building until after acceptance certificate has been issued, and is to replace any cracked or broken panes during said period.

Painting Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(308) **Scope of Work:** This specification and accompanying plans are intended to cover all material and labor necessary to complete the painting and finishing of the exterior and interior of entire building, including ornamental iron, galvanized iron, wood, plaster, etc. This Contractor is referred to Carpenter's, Plasterers and other specifications for extent of work.

(309) **Responsibility:** This Contractor is responsible for any damage to property or work of other contractors on building, caused by him or any employee, and is to take precautions to properly protect all other work during progress of this work. All materials used to be of the best quality. All labor to be performed in a skilled manner and both labor and material to be subject to the approval of the State Department of Engineering. All materials shall be brought to the building in their original packages with seals unbroken and opened in the presence of the Superintendent. They shall be used as taken from the package without cutting or the addition of any material whatsoever except as directed by the Superintendent.

As required by the State Department of Engineering, samples of each material delivered to the building site shall be taken by the Superintendent and sent to the said Department for testing. No materials shall be used until samples of the same have been tested and approved by the State Department of Engineering. All materials not passing the test will be rejected and no such rejected materials shall be used in any part of this work, but shall be removed at once from the building site by the Contractor.

(310) **Lead:** Use pure white lead or red lead, "Pioneer" or other approved make. White lead to be guaranteed to contain at least 92% carbonate of lead and 8% pure linseed oil.

(311) **Linseed Oil:** Linseed oil to be pure and of "National," "Fuller's" or other approved make.

(312) **Turpentine:** Turpentine to be pure spirit turpentine.

(313) **Varnish:** Varnish to be Standard, Fuller's, Pratt & Lambert or Murphy Varnish Company's material, or equal. All varnish used to be very best grade and to be used as delivered, without thinning or other manipulation. Contractor to have manufacturer submit trade name of varnish to be used. All varnish to be delivered at the building in original cans marked with the manufacturer's label, and the same quality of varnish to be used throughout.

(314) **Shellac:** Use pure grain alcohol shellac.

(315) **Filler and Stains:** Use Johnson's, Murphy Varnish Company's, Pratt & Lambert's or other equal approved paste wood filler.

(316) Oak and Mahogany Finish: All oak and mahogany finish basement to top, including vestibule woodwork and elevator cages, to be stained and filled as directed, given one coat of shellac, three coats of varnish, sandpapered between coats and rubbed with pumice stone and water to a dull finish after last coat, then oiled and thoroughly wiped.

(317) Staining: All wood staining to be done as directed, and Contractor is to furnish samples to Architects for approval, either with or without varnish.

(318) Enamel: All enamel to be either "Ripolin," "Vitralite," or equal, applied as taken from can, without being thinned or diluted.

(319) Lead and Oil Paint: Lead and oil paint shall be composed of 65% of pigment and 35% of vehicle. The pigment shall be furnished in paste form, ready mixed, and shall be composed of 6 parts pure lead carbonate, 3 parts pure zinc oxide and 1 part inert pigment, proportioned by weight. Materials shall be ground in pure raw linseed oil and thoroughly mixed mechanically. For exterior work the vehicle shall be composed of 85% to 90% of pure raw linseed oil and from 10% to 15% of pure turpentine dryer. For interior work shall be composed of from 80% to 85% of pure boiled linseed oil and 15% to 20% of pure turpentine dryer.

This Contractor shall furnish proper facilities for proportioning, weighing and mixing of materials, and the State Department of Engineering will give full directions regarding same, which shall be strictly followed by Contractor. All colors will be selected by the State Department of Engineering and shall be obtained by the use of ground colors of best quality added to lead and oil paint as directed.

(320) Priming: Pulley stiles to be oiled, and frames to be primed on sides with lead and oil. All interior wood trim, wainscot panels, etc., to be primed on wall side. All small pieces of trim, such as door and window trimming, picture mould and all pieces under 5 inches in width to be primed with paste filler; all pieces over 5 inches in width, such as base, wainscot panels, etc., to be primed with lead and oil paint. All exterior frames and woodwork to be primed before being set.

(321) Putty: Putty all nail holes, cracks or defects after staining or priming. Putty to be colored to match natural or stained finishes.

(322) Exterior Wood: All exposed exterior woodwork to be given three coats of lead and oil paint, not including priming.

(323) Metal Work: All exterior copper, galvanized iron, tin, iron railing, gratings, vents, flashing, flag pole bases, standards, etc., to receive one coat of pure, dry red lead mixed as follows: 30 pounds of lead, half a gallon of boiled linseed oil, two-thirds of a gallon of raw linseed oil and 4 ounces of pure lampblack ground in oil; and two coats of white lead and oil in colors as directed.

All metal work to be perfectly clean, thoroughly dry before first coat is applied.

(324) Interior Metal Work: All interior metal work of the stairs, elevators, etc., to be cleaned with a wire brush of all plaster, concrete

or other dirt and to receive three coats lead and oil in color as directed. All metal work of vestibule and first floor lobby, including elevator fronts, to have one coat of priming, then covered with real gold metal and glazed, color as directed.

(325) **Pine Finish:** All pine to be given one coat of stain, one coat of shellac and one of Spar Varnish.

(326) **Gum Finish:** All woodwork of Governor's room and reception room to be given a coat of stain color as directed, one coat of shellac and two coats of wax well rubbed out.

(327) **Supreme Court Room:** All white cedar of Supreme Court Room to have three coats of white lead and oil besides priming coat and two coats of enamel, colored as directed, sandpapered between coats and rubbed to a dull gloss with pumice stone and water after last coat. First two coats to have white lead cut with boiled linseed oil and turpentine half and half; third coat to be white lead cut with turpentine only and a small amount of enamel varnish added as a dryer.

(328) **Painting Plaster:** Ceilings and cornices of elevator lobby first floor to be painted four coats of lead and oil paint, with ornament picked out in color and the whole given a wiped glazed coat. Ceiling of vestibule to be given three coats of lead and oil paint, then the ornament picked out in two colors of lead and oil, besides the body color, and the whole to be given a glazed coat and wiped.

All canvas and plaster work of Supreme Court Room, including walls and ceiling, to be painted with four coats of lead and oil. Ornament and coffers of ceiling to be in three different colors and the whole to receive a glazed coat and wiped as directed.

All corridors, main stairway, halls, elevator shafts, soffits of stairs, toilet rooms above marble or tile wainscot, basement to sixth floor inclusive, to have all walls and ceilings painted with white lead and boiled linseed oil and turpentine, colored as directed, using four coats of paint and one of glue size. Last coat to be stippled unless otherwise directed.

All plaster walls of offices, rooms and closets, first to sixth floor inclusive, to have three coats of Brininstool Company's San-A-Cote or equal, color as directed and stippled after last coat. Ceilings of all offices to be glue sized and tinted color directed.

(329) **Canvas:** In the Supreme Court Room this Contractor is to cover the large panel behind the Judges' bench with 10-ounce canvas as shown on drawings No. 12 and No. 107; all wood grounds and splines will be set and fitted by the Carpenter, but this Contractor to do all fastening of canvas into place.

All other panels in the Supreme Court Room marked "canvas" to first have a backing of 40-pound "Akoustikos" felt (manufactured by the H. W. Johns-Manville Company) or equal, glued to the plaster surfaces and then they are to be covered with 10-ounce canvas glued on.

All canvas panels to be painted same as specified for plaster work of Supreme Court Room.

(330) **Burlap:** This Contractor to cover walls and ceilings of the following rooms with burlap as noted on the ⅛-inch scale plans and

drawing No. 106, felt backing being first provided where so called for:

Two Hearing Rooms, first floor, cover ceiling and two side walls of each:

Appellate Court Room, fourth floor, cover walls and ceiling.

Small and Large Court Rooms, fifth floor, cover walls and ceiling.

Where called for felt backing, same to be 40-pound "Akoustikos" felt (manufactured by the H. W. Johns-Manville Company) or equal, glued to the plaster surfaces.

All burlap to be a heavy burlap, closely woven and mangled while wet. Contractor to submit samples of burlap to the State Department of Engineering for approval. Burlap to be glued to plaster or felt backing so as to form a smooth surface, free from wrinkles, and with all joints carefully made.

All burlap to be painted same as specified for plaster of corridors.

(331) Fire Walls and Boiler Room: Backs of fire walls over rear wing and walls and ceiling of Boiler Room to be given one coat of 25% solution of zinc sulphate, followed by two coats of Bay State Cement Coating, Toch's Liquid Konkerite or Jones-Duncan Paint Company's Cementoline or equal, color to be selected by the State Department of Engineering.

(332) Cleaning: All surplus paint and stain shall be removed from the floors, glass and woodwork. All rubbish, surplus material and debris resulting from this work shall be cleaned out and removed from the building and premises at completion by the Contractor at his expense.

(333) Guarantee: This Contractor shall give the State a written guarantee, made upon the form included under head of General Conditions, to fulfil the requirement that the painting, staining and finishing work will not show defect for a period of two years from date of completion and acceptance of building. This Contractor shall repair or replace all defective work, and the damage caused thereby, appearing during this period of time.

Plumbing and Sewer Work

Note—Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(334) Scope of Work: This Contractor shall furnish all materials and labor, and shall build and construct in a good, firm and substantial manner, in place in the building hereinabove named; the drains, sewers and appurtenances, all piping, pipe hangers and supports, valves and fittings of all kinds for both hot and cold water supply; wastes, ventilation of wastes, gas and vacuum cleaning piping, together with any other piping hereinafter specified, and the plumbing fixtures and appurtenances, making the systems of supply, use and waste complete and ready for service, all as shown on the drawings and as hereinafter specified. He shall also furnish all material and labor for and install complete, two storage tanks in attic space, deep well pump and centrifugal pumps with all connecting piping, as shown on diagrams and as hereinafter specified.

(335) Unit Prices: Each bidder must submit with his bid a unit price for furnishing and installing, complete with trimmings, each type of plumbing fixture herein specified. Rough plumbing not included. Said unit prices shall be used for either additions or deductions.

(336) Pipe Sizes: All piping and fittings shall be of the inside diameter designated on the diagrams or hereinafter specified, and no increase or decrease of these pipe sizes will be allowed, except by written permission from the State Department of Engineering. All piping shall be of sizes and weights called for by the Plumbing Law of the City and County of San Francisco, and shall be installed in accordance with these laws.

(337) Cast Iron Pipe and Fittings: Cast iron piping shall be new best quality cast iron hub and spigot pipe, sound, free from defects and of iron that will cut well. It shall be cast in five-foot lengths, smooth inside and with outer and inner surfaces concentric.

Average weight of each pipe, including bell, for cast iron pipe to be used above ground where standard weight pipe is called for by the Plumbing Law, shall be as follows:

6-inch pipe, 52 pounds per 5 feet 0 inches
5-inch pipe, 42 pounds per 5 feet 0 inches
4-inch pipe, 32½ pounds per 5 feet 0 inches
3-inch pipe, 22½ pounds per 5 feet 0 inches
2-inch pipe, 17½ pounds per 5 feet 0 inches

Average weight of each pipe, including bell, for cast iron pipe to

be used under and above ground where extra heavy pipe is called for by the Plumbing Law, shall be as follows:

6-inch pipe, 100 pounds per 5 feet 0 inches
5-inch pipe, 85 pounds per 5 feet 0 inches
4-inch pipe, 65 pounds per 5 feet 0 inches
3-inch pipe, 47½ pounds per 5 feet 0 inches
2-inch pipe, 27½ pounds per 5 feet 0 inches

Any pipe cracked in cutting or otherwise shall be at once removed from the work and no such pipe shall be used in any part of the work.

Fittings for cast iron pipe shall be specially made for drainage purposes, of the same inside diameter as the pipe with which they are to be used and of the same quality and weight in all parts. Fittings shall include elbows, bends, "Y's," traps, etc., and where shown or specified, shall have proper hand holes packed and bolted or fitted with brass screw plugs as directed. Fittings supporting risers shall have a proper shoe cast on them.

Y-fittings and one-eighth (⅛) or one-sixteenth (1/16) bends shall be used wherever possible. Sanitary long-sweep bends and combination Y and eighth bends may be used only for the connection of branch lines to fixtures and on vertical runs of piping, and then only when their use is made necessary on account of clearance or in order to maintain the proper grade, in which case written authorization must be obtained from the State Department of Engineering before said fittings are installed.

All cast iron pipe and fittings shall be dipped in bath of California asphalt. Temperature of said bath shall not be less than three hundred and sixty-five (365) degrees nor more than four hundred and ten (410) degrees Fahrenheit. Pipe and fittings shall remain in the bath until their temperature becomes the same as that of the bath.

All cast iron pipe and fittings shall be Holbrook, Merrill & Stetson Company's, or equal.

(338) Galvanized Wrought Iron or Steel Pipe and Fittings: Wrought iron or steel piping shall be new best quality wrought iron or mild steel screw-jointed pipe, National Tube Company's, or equal, and shall be free from all dents, fins, kinks or burrs. All piping larger than three (3) inch shall be lap welded. Ends of pipe shall be reamed out to full inside diameter and beveled before being made up into fittings. Extra strong galvanized pipe shall be used for dry and wet stand pipes. All other pipe shall be "full weight" and galvanized.

Under no circumstances will the bending of piping be permitted; all changes in direction must be made with the proper fittings.

The fittings for galvanized wrought iron or steel pipe unless otherwise indicated or specified shall be standard banded, cast or malleable iron, galvanized fittings. The fittings for wet and dry stand pipe shall be extra heavy hydraulic malleable iron, galvanized fittings. All fittings shall be National Tube Company's, or equal.

Under no circumstances will sherardizing be permitted in lieu of galvanizing.

(339) Brass Pipe and Fittings: All brass water pipe and brass waste pipe on sewer side of traps shall be wrought iron pipe size and

thickness, and exposed flush pipe and waste pipe on fixture side of trap shall be brass tubing, not less than No. 18 Brown and Sharpe Gauge in thickness. All brass pipe shall be annealed, seamless drawn, finished and nickel plated, unless otherwise specified.

Fittings for brass pipes shall be cast brass, malleable iron pattern, finished and nickel plated, unless otherwise specified.

(340) Terra Cotta Pipe and Fittings: Terra cotta pipe shall be best No. 1 quality, standard strength, vitrified, salt glazed, socket joint, earthernware pipe. The inner surface of said pipe shall be free from all cracks or defects, and shall be perfectly cylindrical. Pipe shall be of uniform thickness and dimensions, subject to the unavoidable variations in burning.

All fittings for terra cotta pipe shall be of corresponding quality and thickness. Y fittings and one-eighth (⅛) or one-sixteenth (1/16) bends shall be used wherever possible.

(341) Pipe Joints and Connections: All joints in cast iron pipe shall be made with a picked oakum gasket and soft pig lead. Joints shall be tightly calked with gaskin, leaving not less than one and one-half (1½) inches depth of lead room. The inside shall be examined, and, if not smooth, shall be made so. A clay roll or a rounded asbestos roll shall be used to make the joints, and it shall be put on so that, after calking, the lead will finish flush with bell. The joints shall be run full with molten lead at one pouring and if they do not fill perfectly, the lead shall be cut out and re-poured. The joints shall then be calked with a proper calking tool and hammer and no lead shall be cut off until calking has been carried all around the pipe. Lead shall then be trimmed and finished smooth with bell.

All joints between cast iron pipe and wrought iron or brass pipe shall be made same as above, the ends of wrought iron or brass pipe to have a ring or part of a coupling screwed on to form a spigot end.

Connections between lead and wrought or cast iron pipe shall be made with brass fittings and wiped joints.

All joints in terra cotta pipe and between cast iron and terra cotta pipe shall be made with Portland cement mortar mixed in the proportion of one (1) part best Portland cement and one (1) part clean, sharp sand, filled full depth and troweled to a smooth bevel around socket of pipe. Said joints shall be left perfectly smooth on the inside.

All joints in wrought iron or steel pipe and connections of same to brass pipe shall be screw joints, made up with ground graphite and boiled linseed oil, screwed home with tongs and wrenches, with not more than three threads on the finished joint remaining exposed.

All union connections on wrought iron or steel pipe two and one-half (2½) inches and larger shall be made with standard flange unions, National Tube Company's, or equal. Gaskets shall be standard, first quality, steam rubber packing, Garlock, or equal, not less than one-sixteenth (1/16) inch thick.

All union connections in wrought iron or steel pipe two (2) inches and smaller shall be made with ground joint unions with octagon head, tail and nut, to meet the U. S. Government specifications. No long screw or other packed joints shall be permitted.

Under no circumstances will the calking of any screwed joints be permitted. Same must, in all cases, be made tight in the manner specified.

All screw joints in brass pipe shall be made with an approved compound or lubricant, and not more than three (3) threads on the finished joint shall remain exposed.

Unions on brass waste pipes on fixture side of traps and unions on all brass flush pipes may be slip or flange joints with soft rubber or leather gaskets.

All union connections in brass water pipes and in brass waste pipes on sewer side of traps shall be made with finished all-brass unions having ground joints, finished same as pipe, the openings through unions to be full area of pipe on which they are used.

(342) Fixture Connections: Connection of each closet, urinal or slop sink to the cast iron soil pipe shall be made with a heavy pattern screw-jointed cast brass flange and galvanized wrought iron or steel nipple of proper length. End of nipple shall be fitted with piece of thread protector or coupling to form a spigot end and shall be calked into bell end of soil fitting as specified for joints in cast iron pipe.

Connections between earthenware of any fixture and flanges on soil pipe to be made absolutely gas and water tight with one-piece special molded asbestos gasket, properly saturated to prevent rotting or drying. Rubber gaskets will not be permitted for this connection, nor will putty be allowed to be used.

(343) Valves: All straight-way valves, sizes two and one-half (2½) inch and larger, except where otherwise noted or specified, shall be standard valves with iron bodies, brass trimmings and wedge gates, Pratt & Cady, Fig. 125, or equal, for flanged outside screw and yoke valves; Pratt & Cady, Fig. 123, or equal, for flanged non-rising stem valves, and Pratt & Cady, Fig. 122, or equal, for screwed valves.

All straight-way valves, two (2) inch and smaller, except where specified otherwise, shall be brass, with wedge gate and gland, Pratt & Cady, Fig. 86, or equal. All drain valves, unless otherwise indicated or specified, shall be of the globe or angle pattern, with removable discs, Pratt & Cady, Fig. 1, or equal. All check valves, unless otherwise indicated or specified, shall be horizontal swing check valves with renewable discs, Jenkins Bros., Fig. 352, or equal.

All main control valves shall have a polished brass plate ½ inch wide by 1/16 inch thick, screwed to handle with two screws. Each plate shall have block letters ¼ inch high, stamped and painted black to indicate the purpose for which valve is to be used.

(344) Compression Stops: All compression stops on exposed supplies shall be of the heavy pattern, Mueller or equal, with full area openings having raised seats and composition discs, and provided with stuffing boxes and threaded inlet and outlet connections. Stops shall be finished brass and, except where otherwise indicated or specified, shall be nickel plated, and provided with lock-shields, hard metal stems and keys. All stops shall have name or trade mark of manufacturer cast or stamped thereon.

Stops on supplies concealed in walls shall be long neck compression stops with stuffing box, lock-shield, cap and key, and adjustable set

screw C. B. flange; rough brass, with top and flange finished and nickel plated, unless otherwise indicated or specified; Haines, Jones & Cadbury Company's Plate R-4410, or equal.

(345) Guarantee on Brass Goods: This Contractor shall furnish to the State a written guarantee from the manufacturers, guaranteeing all brass basin cocks and compression cocks for a period of five (5) years, and any cocks or parts found defective within that time shall be renewed or replaced by the manufacturer without cost to the State.

(346) Securing Piping: All piping throughout the systems shall be firmly secured with proper allowances for expansion and contraction. Whenever suspended hangers are used, all supports must be arranged to prevent swaying. The spacing of points of suspension or support shall in no case exceed ten (10) feet for wrought iron or steel pipe and five (5) feet for cast iron pipe. Each length of cast iron pipe is to be supported directly back of hub. All hangers shall be set to allow for the expansion and contraction of the pipe lines without straining the pipe or hangers. On steel screwed suspended pipe lines, use Falls "Lock-Hinge" hangers or equal, and extension bar, No. 1 bar (seven-eighths (7/8) inch wide, No. 14 U. S. Standard gauge) for three-quarter (3/4) inch to one and one-half (1½) inch pipe, No. 2 bar (one (1) inch wide, No. 12 U. S. Standard gauge) for two (2) inch to three (3) inch pipe, No. 3 (one and one-eighth (1⅛) inches wide, No. 12 U. S. Standard gauge) for three and one-half (3½) inch to six (6) inch pipe, and No. 4 bar (one and one-quarter (1¼) inches wide, No. 12 U. S. Standard gauge) for seven (7) inch to eight (8) inch pipe. On cast iron suspended pipe lines, use separate straps of the above extension bar in place of lock-hinge hangers.

All risers shall have heavy wrought iron clamps or collars for support, spaced not less than one (1) to each floor and at any deflection from the vertical a firm support by bracket or hanger shall be given the riser in its new position. All hangers and collars shall be of a size proportionate to the weight of the pipe supported.

Brass pipes shall be supported, where required, with cast brass supports finished to match the finish of the piping.

Chain or wire hangers will not be permitted. All pipe supports must be installed in a manner approved by the State Department of Engineering.

(347) Pipe Sleeves: Galvanized iron pipe sleeves, one inch greater in diameter than the pipe passing through same shall be accurately placed and lower flanged ends securely fastened to form and sleeve filled with sand before concrete is poured where pipes pass through concrete floors, walls or partitions (except pipe passing through waterproofed walls and pipe for wall hydrants) so that no cutting of concrete will be necessary.

(348) Floor, Wall and Ceiling Plates: Where exposed pipes pass through floors, finished walls, or finished ceilings, they shall be fitted with solid one-piece floor and ceiling plates not less than three thirty-seconds (3/32) inch thick. Plates on polished brass pipe shall be polished cast brass; plates on nickel plated pipe shall be finished cast brass, nickel plated; plates on iron pipe shall be cast iron, nickel plated

or bronzed. Wall and ceiling plates shall have suitable round-head set screws.

(349) Rodding Holes: Rodding holes of same diameter as pipe shall be placed in all horizontal sewer and down-spout lines at all points of change of direction, at the base of all soil and waste drops and at all other points where indicated. All rodding holes for cast iron and wrought iron pipe shall be closed with heavy brass male-threaded screw plugs at least one-eighth (⅛) inch in thickness in the ferrule part, and with three-sixteenths (3/16) inch in thickness in the cover, the cover to have a solid cast square head one and one-half (1½) inches square and one (1) inch in height. For cast iron pipe, said plugs shall screw into heavy brass end ferrules not less than three-sixteenths (3/16) inch in thickness. All rodding holes in building, not otherwise readily accessible, shall be installed with extra heavy brass tap screws with sockets and projecting beveled flanges of greater diameter than the fittings into which they screw; bottoms of flanges shall be set flush with floor. Finish shall be the same as trimmings in room.

(350) Cleaning and Closing of Piping: Special care must be taken to clean the interior of all piping before erection. This Contractor shall, as fast as his pipe lines are installed, cap or plug all openings, to prevent the entrance of any materials that would obstruct the pipes. These caps or plugs shall be left in place until their removal is necessary for the setting of the fixtures. All hand-holes, cleanouts and rodding holes shall be closed immediately upon being installed and the interior of all piping shall be kept clean.

(351) Closing in of Uninspected Work: This Contractor shall not allow or cause any of the work installed under the specifications to be covered up or enclosed before it has been inspected, tested and approved by the State Department of Engineering. Should any of the work be enclosed or covered up before it has been approved by said Department of Engineering, he shall, at his expense, uncover the work and, after it has been inspected, tested and approved, make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of the cutting.

(352) Terra Cotta Sewers: All sewers outside and to within six (6) feet of the building wall shall be made of terra cotta pipe of sizes shown on plumbing diagrams, and shall terminate where and as indicated on said diagrams.

Each pipe shall be laid true to line and grade, rising not less than one-tenth (1/10) inch to each one (1) foot in length, unless otherwise ordered in writing by the State Department of Engineering. Each pipe shall be bedded in dry sand and joints shall be made up as hereinabove specified under "Pipe Joints and Connections." The interior of the sewer must be carefully freed from all superfluous cement, dirt or other material of any description, as the work progresses. For this purpose, a disc, mould or swab, suitable for its purpose and attached to a rod sufficiently long to pass two (2) joints from the end of the pipe last laid, shall be provided. All joints shall be left perfectly smooth on the inside.

After the work has been inspected and accepted by the Inspector, dry sand shall be filled in and tamped solidly to six (6) inches above pipe. Above this, the trenches shall be back-filled as hereinafter specified.

(353) Downspouts: All downspouts from roof to and through basement wall and to a point six (6) feet outside of building wall shall be made of cast iron pipe and fittings of weights specified under "Cast Iron Pipe and Fittings" for cast iron pipe to be used under and above ground.

Except where otherwise shown on plumbing diagrams, all downspout lines in ground to within six (6) feet of the building wall shall be made of terra cotta pipe of sizes indicated and shall be laid in the same manner as hereinabove specified for terra cotta sewers, except that grade shall not be less than one-twelfth (1/12) inch to each one (1) foot in length, unless otherwise ordered in writing by the State Department of Engineering. Said downspout lines shall be connected to the storm-water sewer in accordance with the rules of the City of San Francisco.

(354) Cast Iron Sewers, Soil, Waste and Vent Lines: All sewers in the ground from a point six (6) feet outside the building wall, through and inside said wall, and all sewers suspended below first floor and all soil, waste and vent piping, except wrought iron vent piping called for by the Plumbing Laws, shall be made of cast iron pipe and fittings of weights specified under "Cast Iron Pipe and Fittings" for cast iron pipe to be used under and above ground. All lines shall be run true to line and grade, rising not less than one-eighth (1/8) inch to each one (1) foot in length, unless otherwise ordered in writing by the State Department of Engineering. Special care shall be taken to install the sewer pipe as shallow as practicable where leaving building. Wherever possible, forty-five (45) degree venting shall be used.

(355) Offsets: No offsets will be permitted in any sewer, drain, soil, waste or leader pipes having an angle more acute than that presented by a one-sixth (1/6) bend.

(356) Sewer Traps: Place on each sewer line near curb, where directed by the State Department of Engineering, a six (6) inch running trap with cleanout, and a six (6) inch air inlet pipe on house side of trap with cast iron air inlet box with grating, all as required and approved by the San Francisco Board of Health.

(357) Flashing: All pipes passing through roof shall be flashed at roof lines with sheet lead weighing not less than six (6) pounds per square foot. One piece shall be cut in center to slip snugly over the pipe and shall extend not less than ten (10) inches in all directions from pipe. Solder securely to this sheet a sleeve fitting closely around pipe and projecting not less than three (3) inches above finished roof. Run a tube from the finished roof to top of pipe, turning it down not less than one (1) inch inside same. This tube shall fit snugly outside of the projecting sleeve, but shall not be fastened to it.

All vent pipes shall be extended at least fourteen (14) inches above surface of roof.

(358) Carpentry: All carpentry work necessary for grounds and supports in connection with the installation of the work covered by these specifications, together with all cutting and patching, shall be done by Carpenter Contractor, but under the supervision of this Contractor. This shall not include the uncovering of work and repairs mentioned under "Closing in of Uninspected Work."

(359) Test of Drainage Piping: At such times as the State Department of Engineering may direct this Contractor shall stop all openings in soil, waste, drain and vent piping, set up the necessary stand pipes and fill with water to the level of top of highest vent and allow to stand at least one (1) hour, or longer time, as may be required by the Inspector to make a complete examination of the entire division of the system being tested. The downspout and storm-water system shall be tested by stopping up all lower openings, filling the entire system with water up to the level of the highest gutter and proceeding as above. If any leak shows in pipe or joints, this Contractor shall make same good and repeat the test, and he shall not be entitled to demand or receive final certificate until the work is made tight as herein contemplated.

(360) Test of Water Supply Piping: At the completion of the work, except the application of non-conducting covering, all water supply piping, both hot and cold, shall be tested and made tight under hydrostatic pressure of one hundred (100) pounds per square inch. Wet and dry stand pipes shall be tested and made tight under a hydrostatic pressure of three hundred (300) pounds per square inch. These pressures shall be maintained without fluctuation of gauge for a period of one (1) hour, or longer time, as may be required by the Inspector to make a complete examination of the entire division of the system being tested, without additional pumping. The test pump must be provided by this Contractor and he shall not be entitled to demand or receive final certificate until the work is made tight as herein contemplated.

(361) Temporary Toilets: When directed by the Superintendent, this Contractor is to install, in an enclosure furnished by the Carpenter Contractor, two temporary toilets complete with bowls, tanks, etc., and connect same to water supply and sewer. Temporary toilets to remain and be kept in working order by this Contractor until ordered removed by the Superintendent.

(362) Dry Stand Pipes: This contractor shall install three 5-inch dry stand pipes, which shall extend from four feet above the sidewalk to and through the roof as indicated on the drawings. Siamese connections shall be Holbrook, Merrill & Stetson Company's E-4402, or equal, with caps and chains and three (3) inch regulation hose threads. At each floor install a three (3) inch standard brass hose gate valve, Crane Company's No. 452, or equal, with cap and chain, rough body, finished brass trimmings and brass wheel, nickel plated all over, with nickel plated cast brass flange at wall. These stand pipes are to be installed according to the rules of the San Francisco Fire Department.

(363) Hot and Cold Water Piping: All hot and cold water piping shall be galvanized wrought iron or mild steel pipe, all as specified

under "Galvanized Wrought Iron or Steel Pipe and Fittings." Same shall be installed where shown and shall terminate where and as indicated on the Plumbing Diagrams.

(364) Non-conducting Covering: After all hot water piping is thoroughly tested and accepted, said piping, with the exception of such portion thereof as may in certain cases be installed in Heater Room, and which will in those particular cases be covered by the Heating Contractor, shall be covered with H. W. Johns-Manville Company's "Asbestocel" or equal, asbestos sectional pipe covering three-quarters (¾) inch thick.

All fittings in hot water lines shall be covered with eighty-five (85%) per cent carbonate of magnesia cement, made flush with adjoining pipe covering.

All covering shall be finished with a four (4) ounce drill jacket smoothly and securely pasted on, using Johns-Manville Dry Powder Paste or equal, and held in place by means of brass lacquered bands three-quarters (¾) inch wide, applied at the rate of two (2) bands per section of pipe covering and one (1) on each side of and close to all fittings, valves, etc.

All canvas shall be thoroughly sized with the above mentioned paste, and after covering has thoroughly dried, same shall be painted as hereinafter specified. Bands shall not be applied until after paint has dried.

All covering specified above shall be applied by none but experienced professional pipe coverers.

(365) Painting: This Contractor shall paint no pipes or other equipment in Boiler Room. All piping, hangers, etc., exposed in basement shall be painted two coats of lead and oil paint of an approved make—color to be selected by the inspector. All cast iron dipped pipe shall be given one good coat of shellac before applying lead and oil paint. All other exposed soil, waste, vent, and water supply piping above ground (except dipped pipe in good condition), together with all fittings, pipe hangers, anchors, guides and exposed threads, shall be painted two coats of Standard Oil Company's "Oronite" or equal. Pipe covering shall be given one coat of sizing made with Johns-Manville, or equal, dry powder paste, and two coats of Johns-Manville Company's white "Asbestos Fire Proof Paint," or equal. After paint or pipe covering has thoroughly dried, the bands shall be applied as hereinabove specified.

The storage tanks in the attic shall be painted one coat of red lead, outside only, and one coat of Paraffine Paint Company's "Pabco," or equal, on all surfaces.

Paint shall be applied of the consistency regularly supplied and recommended by the manufacturers. All surfaces to be painted shall be dry before painting, the metal surfaces being thoroly cleaned and brushed with stiff wire brushes before paint is applied. The first coat shall be inspected and approved by the Inspector and allowed to dry before the second coat is applied. The first coat shall cover all of the surface which is to be painted.

(366) Location of Pipes: This Contractor shall confer with the other Contractors installing pipes and with the Inspector in regard to

pipe locations. No cold water supply line to fixtures shall parallel a steam return or hot water line at a less distance than ten (10) inches center to center, except where necessary in the immediate vicinity of the fixture being served.

All piping shall be run concealed throughout, unless otherwise indicated or specified, and as little cutting of walls and floors shall be done as possible in securing the proper installation.

This Contractor shall, upon completion of his work, furnish the State Department of Engineering with accurate diagrams drawn to scale showing the final locations of all piping, fixtures, etc., included in his contract. These diagrams shall show at least as much detail as the diagrams furnished by the State and shall also show all anchors, guides and special features which he has installed.

(367) Excavation: This Contractor shall perform all excavation necessary for the proper installation of the complete systems of piping herein specified, digging trenches of sufficient size to allow of easy access to all the work.

(368) Backfilling: As fast as pipe is laid in the ground, dry sand or earth shall be rammed into place at sides of pipe, leaving the joints and top exposed until piping is tested. After testing, the trenches shall be filled in layers not more than nine (9) inches thick, each layer being solidly rammed with an iron rammer.

(369) Diagrams: The general layout as shown on plumbing diagrams must be followed in all cases, except where architectural drawings conflict with said diagrams. This Contractor must examine all architectural drawings and structural diagrams carefully before beginning the work and report to the State Department of Engineering any discrepancies which occur, and he shall not be entitled to any extra compensation for any omissions or defects in plumbing diagrams when they conflict with other drawings.

The plumbing diagrams and details (Sheets Nos. M-1 to M-8, inclusive, of Plan No. ——) and such writings, interlineations, figures and details as may be upon them are to be considered as part of and illustrating these specifications, and any work or materials shown on the drawings and not mentioned in the specifications or work or material herein specified and not shown on the drawings shall be executed by this Contractor the same as if specially mentioned by both. In the Boiler Room Arrangement Sheets M-19 and M-20, this Contractor shall install such portions of the equipment as are noted hereon or hereinafter specified as being installed by him.

(370) Catalogs: Catalogs of all concerns mentioned in these specifications, showing the fixtures described, are on file at the office of the State Department of Engineering and may be used for comparison by contractors wishing to submit bids.

Wherever the words "Government Specifications" are used in these specifications, they shall refer to the "Specifications for Plumbing Fixtures, etc., for the Treasury, War and Navy Departments" as amended in 1911, copies of which may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at thirty-five (35) cents per copy.

(371) General Requirements for Fixtures: All fixtures must be first class in every respect, true to shape, size and color. No warped or chipped fixtures will be accepted. The body and glaze of all fixtures must be as near white as possible. Furthermore the glaze must thoroughly cover all parts of the fixture in accordance with the best standard practice.

Any fixture that does not operate satisfactorily after being set up shall be removed by the Contractor at once and new fixture of proper design installed. All finish plumbing shall be accurately lined up, and where batteries of fixtures occur, special care shall be taken with the roughing-in and finished plumbing.

The number and position of all plumbing fixtures are shown on the plumbing diagrams. All local connections to fixtures shall be of the sizes indicated thereon.

All water supplies to fixtures, unless otherwise specified, shall be provided with compression stops of the type herein specified.

Each connection to cock or bibb shall be provided with an air hammer at least twelve (12) inches long, set in wall.

(372) Guarantee on Nickel Plating: All nickel plating shall be guaranteed in writing not to peel or rub off for a period of five (5) years from date of completion and acceptance of the building. Any parts rubbing or peeling off during said five (5) years shall be removed and re-plated, or new parts set in their place by this Contractor without extra cost to the State.

(373) Drains and Sump: Floor drains in shower stalls shall be combination cast brass floor drains and deep seal traps with two (2) inch waste connections. Tops of floor drains shall have polished brass covers with brass strainers five (5) inches in diameter. Bodies of traps shall be at least five (5) inches outside diameter with walls not less than five thirty-seconds ($\frac{5}{32}$) inch thick. Drains and traps shall be as delineated on Plate No. 22 of Government Specifications.

Floor drain in Boiler Room and the two drains in gutter of area at northwest angle of the building shall be M. Greenberg Sons', or equal, 8-inch by 8-inch drains, with polished brass tops and 3-inch waste connections.

The two drains in the open court shall be Clow A-2835, or equal, cast iron drains 12 inches by 12 inches, with outlets for 3-inch soil pipe.

The Contractor shall furnish, install and connect the drainage line from the blow-off basin and sump as indicated, complete with all fittings. Vents from traps to be connected to 4-inch vent from blow-off basin as shown, this 4-inch vent to be installed by Heating Contractor. Back water valves shall be "Palmer" Back Water Traps with extension manhole having iron ferrules and brass trap screw set flush with floor. Gate valves shall be Crane No. 462, or equal, iron body gate valves with hub ends, set as directed by the State Department of Engineering.

(374) Hose Bibbs: Install in Boiler Room, where indicated, two (2) three-quarter ($\frac{3}{4}$) inch heavy pattern, brass hose end, compression bibbs with stuffing boxes, Mueller E-1710, or equal. Install where indicated on outside wall of building at a suitable height above the ground, as instructed by the State Department of Engineering, three-

quarter (¾) inch heavy pattern, brass hose end, compression bibbs with stuffing box and loose key, Mueller E-1711, or equal.

(375) Hose Reels: Hose reels shall be swinging wall reels, Lightning Hose Rack Company's Plate No. 6, or equal, with aluminum bronze finish applied after the castings have been rendered smooth. Valves shall be Lightning Hose Rack Company's latest approved Underwriters' brass angle valves, or equal, with soft disc, rough body, finished brass trimmings and brass wheel, nickel plated all over, and with nickel plated cast brass flange at wall.

Hose shall be best one and one-half (1½) inch inside diameter unlined linen fire hose approved by the Underwriters' Laboratories, with labels attached. Each length shall be provided with nickel plated brass expansion ring couplings, with lugs, one and one-half (1½) inch nickel plated brass hose pipe with screw tip, Crane No. 900, or equal, and one (1) nickel plated spanner for each hose reel, to fit hose coupling. Spanner to be hung up near hose reel. All hose couplings and connections shall have same hose threads as those in use by the San Francisco Fire Department. The length of hose to be supplied for each reel is noted on the plumbing diagrams at each hose reel location.

(376) Water Closets: Water closet bowls shall be similar to "Pacific" Plate C-510L and shall follow in detail the specifications for the United States Government Bowl No. 54, as shown and specified on Plate No. 4 and page No. 21 of "Specifications for Plumbing Fixtures, etc., for the Treasury, War and Navy Departments," as amended in 1911, except that bowl is to have full extended lip. Each bowl shall be fitted with well-seasoned, open-front saddle pattern, not serpentine, white oak seat, strongly framed and highly polished, not less than one and five-sixteenths (1 5/16) inches finished thickness, with one piece, cast brass, nickel-plated reinforcing and box hinge plate, secured to woodwork with oval head countersunk screws; reinforcing ring to be provided with two sockets fitted with mushroom rubber bumpers. Hinge posts to be cast brass, secured to bowl with half round rubber cushion washers and brass N. P. hexagon nuts. All exposed parts of brass work to be finished and nickel plated.

(377) Stall Urinals: Stall urinals shall be of a type similar to Crane Company's B-4174 white porcelain urinal with integral drip receptor and extended shields, eighteen (18) inch size, N. P. brass inlet connections and spreader, three (3) inch N. P. brass outlet strainer with removable vitreous grating. Urinals set in battery shall be at least six (6) inches apart. Stalls shall be set with lips flush with floor to serve as floor drains. Install traps and vents as shown.

(378) Flushing Valves: All toilet bowls and all stall urinals shall be fitted with finished brass, nickel-plated flushing valves, of a type similar to the Standard Sanitary Manufacturing Company's "Republic" flush valve. Flush valves shall be so designed that they will satisfactorily flush the bowl with the minimum amount of water, shall cause absolutely no water hammer in the piping system, and shall have a regulating device to readily adjust the amount of flush water and give

the proper afterfill. The ease with which this adjustment can be made will be a factor in selecting the valves. Each valve must be provided with plug stop or nickel-plated valve preferably integral with flushing valve.

The manufacturer must furnish a written guarantee that the water surface in the bowl can be maintained throughout the entire building under pressures ranging from seven (7) pounds to sixty (60) pounds.

(379) Lavatories: Lavatories for all main toilet rooms and all other rooms where tile wainscot is used shall be 20 inches by 24 inches, vitreous china, without backs, in strict accordance with the specifications for the United States Government Lavatory No. 24R, installed on hangers, all as shown and specified on Plate No. 13 and page No. 32 of "Government Specifications."

Lavatories for offices and small toilet rooms where walls are not finished in tile, unless otherwise noted on plan, shall be vitreous china, straight-front lavatories, 18 inches by 20 inches, with square backs six (6) inches in height, china extension for support; slab, rear outlet oval bowl, overflow and curtain all in one piece; of a type similar to "Pacific" plate C-55.

Faucet for cold water on all lavatories shall be Mueller No. E-01998, or equal, Rapidac compression cock with plain brass top lever handle and china index nut, nickel plated. Faucet for hot water shall be Mueller No. E-1998, or equal, self-closing basin cock of the same exterior design as the cold water faucet. Faucets to have three-eighths (⅜) inch I. P. S. N. P. brass supplies to wall, with N. P. C. B. flanges, with N. P. brass angle compression cocks of the type hereinabove specified. The connections between faucets and supply pipes shall be N. P. brass ground joint unions. Furnish N. P. chain stay, chain, and rubber stopper, cast brass waste plug and one and one-half (1½) inch C. B. N. P. "P" trap with cleanout plug.

(380) Drinking Fountains: Drinking fountains shall be Haws Sanitary Drinking Faucet Company's Ideal Model No. 7-B, or equal, comprising a vitreous china receptor, cast concealed brass trap, Haws vitreous china 1¾-inch ball drinking head, concealed cast iron wall hanger, self-closing Mueller special valve, with loose key regulator. Install compression stop in concealed supply.

(381) Drinking Faucet: Install over center of lavatory in basement toilet room, as directed by the State Department of Engineering, one Haws Sanitary Drinking Faucet Company's Model No. 4 drinking faucet, or equal, complete with Mueller N. P. self-closing valve with concealed regulating screw and Haws' vitreous china 1¾-inch ball drinking head.

(382) Slop Sinks: Slop sinks shall be of a type similar to "Standard" plate F-2922, vitreous china roll rim slop sink, on Plate P-7280 cast iron trap standard, floor outlet, enameled all over with cleanout plug, less vent, fitted with H-7617 compression double slop sink cock, china indexed handles, pail hook, and supporting brace to wall. Slop sink shall be braced to wall by means of a suitable strap iron around top of trap standard and bolted to wall. Strap to be painted white.

(383) Shower Baths: The shower bath shall be of a type similar to Speakman Institution Shower Plate G-990, with No. 2 mixing valve, strainer unions, cast brass needle head with removable face, adjustable ball joint and supplies to wall. The supply inlets are to be provided with lock-shield controlling valves. Mixing valves to have ¾-inch supplies and ¾-inch discharge.

(384) Gas Piping: All gas piping shall be galvanized wrought iron or mild steel pipe, all as specified under "Galvanized Wrought Iron or Steel Pipe and Fittings," and under "Pipe Joints and Connections." Same shall be installed where shown, shall terminate where and as indicated on the plumbing diagrams and shall be firmly secured in place in the manner specified under "Securing Piping." Each length of pipe must be hammered and all scale blown out before assembling. All gas pipe shall be installed in a workmanlike manner, of sizes shown on drawings, using all necessary fittings and in no case springing or bending the pipe to reach a point desired. Outlets in rooms shall be in the center of baseboard.

(385) Gas Joints: Pipe and fittings shall be put together with boiled linseed oil and litharge in the manner hereinabove specified. No gas fitters' cement or sealing wax shall be used, except at outlet caps. The use of salt water or any other corrosive substance to make piping tight is strictly prohibited.

(386) Grading and Drips, Gas Piping: All pipes shall be graded toward ends of mains. Insert in ends of mains, as near base of riser as possible, a tee fitting. A twelve (12) inch piece of three-quarter (¾) inch pipe shall be screwed into fitting and terminate with a gas cock so that drip can be collected and drawn off when necessary. There shall be no other traps or depressions in gas lines where condensation will remain.

(387) Gas Cocks: All gas cocks above specified for drips are to be special heavy brass gas service cocks with square heads, Mueller's E-4692, or equal. All other outlets shall be capped.

(388) Test of Gas Piping: Gas piping shall be tested by plugging or capping all outlets and subjecting the system to an air pressure of not less than twenty (20) inches of mercury, which pressure shall be maintained, without additional pumping, for a period of one (1) hour without a drop of more than one-quarter (¼) inch in the mercury column during this time. Test pump and gauge must be provided by the Plumbing Contractor. Test to be made in the presence of the Inspector. Pipes must not be filled with water for the detection of leakage or any other purpose and no gas fitters' cement, sealing wax, etc., shall be used for the stoppage of leaks.

(389) General Requirements—Vacuum Cleaning: This Contractor shall furnish and install all concealed suction piping for vacuum cleaning system, as shown on drawings and as hereinafter specified, complete with fittings of all kinds, pipe hangers and supports, inlet valves, floor ceiling and wall flanges. The exposed suspended mains in basement, exhaust stack, machine, tools and hose are not included in this contract, but are to be furnished by the State at some future date.

(390) Suction Pipe and Fittings—Vacuum Cleaning: All suction piping shall be new, "full weight," galvanized wrought iron or steel pipe as hereinabove specified. Care must be taken to clean the interior of all piping before erection and in erecting pipe to maintain as nearly as possible a smooth, uniform bore through all pipe and fittings.

All fittings for vacuum lines shall be of the recessed drainage type and shall be made of tough gray cast iron, free from blow holes or other defects; smooth castings in all cases. Same shall be galvanized, must have inside diameter through body of same size as pipe bore, and all fins, burrs, or rough places must be removed. Where space permits, all tees and elbows must have a radius at center line of not less than three (3) inches. All fittings having less than three (3) inch radius must have the thickness of metal on sides receiving the impact of dust increased fifty (50) per cent above standard thickness.

(391) Joints—Vacuum Lines: All joints in vacuum lines shall be made by butting the ends of the pipe in the couplings to insure a perfectly smooth and uniform interior surface, free from all places for the lodgment of foreign substances passing through the pipe during the sweeping of the building. The joints between the pipe and fittings shall be made by screwing the pipe up against the shoulder in the fitting. In case the ends of pipe cannot be made to butt up tight to make a smooth surface in coupling or fitting, the space shall be properly filled with a satisfactory material to be approved by the State Department of Engineering. The only filler that may be used in making up joints in pipe lines shall be boiled linseed oil and ground graphite.

(392) Cleanouts—Vacuum Lines: Cleanouts shall be placed in all horizontal lines of piping at all points of change of direction, at all other points where indicated and at the bottom of all risers. Cleanouts shall be three (3) inches in diameter for all pipe lines three (3) inches and larger, and the same size as the pipe for all lines smaller than three (3) inches. In all cases, cleanouts must be arranged so that same cannot receive the direct impact of the moving air and that when the cleanout tool is inserted in the pipe same will enter in the direction of the flow of air. Cleanouts shall consist of the proper fittings, plugged with an extra heavy brass trap screw, with a square or hexagonal nut not less than one (1) inch high and with a side or least diameter not less than one and one-quarter (1¼) inches. Cleanouts that occur in finished floors shall have heavy polished brass floor plates set with the top of the plate flush with the finished floor and fitted with an extra heavy polished brass trap screw having a one (1) inch square recess not less than one-half (½) inch deep, and threaded and screwed up so that its top is perfectly flush with the finished floor and floor plate.

(393) Pitch—Vacuum Lines: All horizontal mains and branches throughout the system shall have a pitch in the direction of the flow of air of not less than one-fourth (¼) inch in ten (10) feet.

(394) Inlets and Inlet Valves—Vacuum Lines: All inlets shall be located where shown on the drawings and shall be of the wall type, located at center of baseboard. All openings to receive inlet valves shall be threaded with a standard thread and the face of the fitting to receive the inlet valve shall not be less than one-half (½) inch from

the face of baseboard or finished floor. After piping system has been tested and made tight, as hereinafter specified, all inlets shall be provided with the "Spencer" Type C, or equal, one and one-half (1½) inch heavy cast brass flush inlet valves, set flush, in each case, with the face of baseboard. All inlet valves shall be finished to match the finishing hardware used throughout the building.

(395) Testing—Vacuum Piping: The entire vacuum piping system shall be tested and made tight under a hydraulic pressure of twenty-five (25) pounds per square inch at the highest point in the system, which pressure shall be maintained without fluctuation of gauge for a period of one (1) hour, or longer time, as may be required by the Superintendent to make a complete examination of the entire division of the system being tested, without additional pumping.

(396) Well: There will be installed by the State a twelve (12) inch cased well in the location shown in Boiler Room. This Contractor shall cut the top of well casing to the required level and make proper watertight connection to the deep well pump head, with C. I. flange connection.

(397) Deep Well Pumping Unit: This Contractor shall furnish and install complete where shown in Boiler Room, one (1) Duplex plunger pump head "Pomona" No. 7½, or equal, direct connected to a 7½-horsepower, 230-volt, 850 R. P. M., compound wound, direct-current motor, General Electric Company's Type R. C., or equal, together with pump casing, cylinder, plunger rods, and discharge pipe to storage tank, making the pumping unit complete and ready for operation. The pump shaft, geared to run at a speed of 160 R. P. M., shall be fitted with a cut gear to ride into a rawhide pinion on an extended motor shaft, with suitable bearing and flexible coupling to assure alignment with the motor.

The pump casing connecting the cylinder in the well with the pump head shall be eight (8) inch outside diameter screwed well casing weighing twenty (20) pounds to the foot.

The cylinder shall be seven (7) inches inside diameter, cast from special phosphor bronze, accurately bored and polished, making an absolutely true working barrel for the plungers. The bottom of this cylinder shall be fitted with a suction pipe six (6) feet long, with sufficient three-quarter (¾) inch holes drilled in the lower two feet of pipe to give twice the area of the suction pipe. The Duplex plungers shall be fitted with three cup leathers.

The inside rod operating the lower plunger shall be made of solid steel threaded and coupled with extra long couplings of phosphor bronze. Outside rods shall be joined together with extra long forged steel couplings.

The pump shall be provided with slide rails so that the pump head can be disconnected from the rods and slide back to allow easy access to rods and casing if it is desired to remove same from well.

Casing and rods are to be installed in short lengths so they can be raised and removed from the well. For the purpose of removing these rods, this Contractor shall furnish and install in the first floor slab directly over the well, a hook with a one-ton chain block.

It is the intention to have the pump barrel set at such a depth that the bottom of the six (6) foot suction pipe shall be sixty-five (65) feet below the level of the Boiler Room floor.

The pump will not be accepted until it operates without any noise. All bearings and links must be without any play so that there will be no pounding.

(398) Guarantee for Deep Well Pump: The pump must be guaranteed by the manufacturer to deliver 100 gallons of water per minute, from the well at a depth of sixty (60) feet below the level of the Boiler Room floor, through a three (3) inch pipe with six (6) elbows, into the storage tank one hundred (100) feet above the level of the Boiler Room floor. The pump shall also be guaranteed to operate at a minimum efficiency of 70%.

(399) Centrifugal Pump: This Contractor shall furnish and install complete, together with concrete foundation, one single-stage, double-suction volute centrifugal pump, having three (3) inch suction and two and one-half (2½) inch discharge, with horizontally split case, direct connected to a 10-horsepower, 230-volt, 1,700-R. P. M., compound wound, direct-current motor, General Electric Company's Type R. C., or equal, all mounted on a cast iron base.

Bearings shall be of the ring oiling type with renewable split shells and shall be separated from the water chamber. Impeller, impeller bushings and casing bushings shall be of bronze. Pump shall have non-overloading runner.

This pump is for the purpose of pumping water from the Spring Valley mains to the storage tank in the attic if the Spring Valley pressure should drop below normal, or, in case of fire, to boost the pressure in the supply pipes to the hose reels.

This pump shall be guaranteed by the manufacturer to deliver 150 gallons of water per minute from the Spring Valley supply into the storage tank 100 feet above the Boiler Room floor without overloading the pump, and to operate satisfactorily under any conditions it is required to meet as hereinbefore mentioned.

The Contractor shall furnish to the State Department of Engineering complete specifications and efficiency curves for two different makes of pumps which will fulfil the requirements mentioned above, the State to have the option of selecting either of the pumps on which specifications are submitted.

(400) Electrical Equipment and Wiring: The Electrical Contractor will furnish all wiring and conduit from float switches in attic to motors and make the installation complete ready for connecting leads to motors. This Contractor shall furnish and deliver to the Electrical Contractor one 7½-horsepower and one 10-horsepower direct-current counter E. M. F. self-starters for pilot circuit control, General Electric Company's C. R. 2303, Catalog No. 194561, or equal, suitable for mounting on a one and one-quarter (1¼) inch panel. He shall also furnish and deliver two single pole totally enclosed float switches, General Electric Company's C. R. 2931, Form D, Catalog No. 141648, or equal.

This Contractor will be required to connect leads to motors and will be responsible for direction and satisfactory operation of motors.

He shall also give the Electrical Contractor exact location of motors in order that conduit lines to same may be properly placed.

(401) Water Storage Tanks: This Contractor shall furnish and install two storage tanks in attic, 7 feet 0 inches by 21 feet 0 inches by 7 feet 0 inches high, inside dimensions. These tanks shall be constructed of No. 8 U. S. Standard gauge black tank steel plates and properly reinforced and braced with 3-inch by 3-inch by ⅜-inch steel angles. All joints shall be well riveted, caulked and made thoroughly watertight. All tappings shall be reinforced with flanges. Storage tanks shall be supported from floor slab by suitable concrete supports.

Cold water supplies shall discharge into storage tanks through three (3) inch, all brass "NevRlek" float valves with renewable vulcanized rubber discs. Contractor should order these valves as soon as contract is signed, to insure delivery.

Contractor shall submit scale drawings for the approval of the State Department of Engineering showing in complete detail the construction, dimensions, supports and connections to storage tanks before proceeding with the fabrication.

(402) Permits: This Contractor shall take out and pay for all necessary permits to comply with the laws of the City and County of San Francisco for all work done under this contract.

(403) Guarantee: This Contractor hereby becomes responsible for all labor, material and apparatus installed under these specifications and shall guarantee the proper operation of same for a period of one (1) year from and after the date of final certificate. He shall make good, repair or replace at his own expense, as may be necessary, any defective work, material or parts which may show itself within said one (1) year from and after the date of final certificate, if, in the opinion of the State Department of Engineering, such defect is due to imperfection in workmanship, or materials as specified.

This Contractor shall give the State a written guarantee, signed by himself, covering the requirements mentioned above, in addition to the written guarantee on brass goods, nickel plating and flush valves which are to be furnished by the manufacturers.

Heating and Ventilating Work

Note: Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(404) Scope of Work: The work covered by these specifications includes all Boiler Room equipment, all indirect heating and ventilating equipment for the ventilating systems, and all direct heating apparatus, including all piping, radiators, thermostatic traps and receivers, valves and fittings of all kinds, pipe hangers and supports, pipe anchors and guides, painting and bronzing, fans, motors, coils, systems of galvanized iron ducts and temperature control, together with all plant labor and materials necessary to equip the entire building with a heating and ventilating system complete and ready for service, all as shown on the several drawings and as hereinafter specified.

Each bidder shall submit with his bid a complete list of all equipment which varies in any particular from the equipment specified, and he shall give manufacturer's name, size, type, capacity, etc., of any equipment not fully described by the plans and specifications.

(405) Diagrams: The general layout as shown on heating diagrams must be followed in all cases, except where architectural drawings conflict with said diagrams. This Contractor must examine all architectural drawings and structural diagrams carefully before beginning the work and report to the State Department of Engineering any discrepancies which occur, and he shall not be entitled to any extra for any omissions or defects in heating diagrams when they conflict with other drawings.

The Heating Diagrams and Details (Sheets Nos. M-9 to M-18, inclusive), together with such portions of Sheets Nos. M-19 and M-20 as may refer to the work of the Heating Contractor, and such writings, interlineations, figures and details as may be upon them, are to be considered as part of and illustrating this specification, and any work or materials shown on the drawings and not mentioned in the specification, or work or material herein specified and not shown on the drawings, shall be executed by this Contractor the same as if specially mentioned by both.

(406) Furring, Cutting, Patching: The vertical vent ducts from main Court Room to attic and from Business College to attic will be furnished by others, but this Contractor must lay out openings in walls and floors for other contractors and shall be responsible for their proper location. This Contractor must confer with other contractors as to location of thimbles, chases and conflicting apparatus. Galvanized iron thimbles must be placed in forms by this Contractor wherever pipes are to pass through concrete work. These thimbles are to be placed and securely fastened to forms sufficiently ahead of concrete men so as not to delay their work. All chases and openings in masonry will

be left by Mason Contractor, but this Contractor must locate same. Should this Contractor neglect to, or incorrectly locate openings, chases or thimbles, he shall be required to cut same at his expense and under the supervision of an authorized agent of the State Department of Engineering. This Contractor shall be required to do all patching where openings or damage to wall or floors has been occasioned by his work.

(407) Excavating and Back Filling: This Contractor shall do all excavating and back filling necessary for the proper installation of the work covered by these specifications. In back filling, all earth shall be thoroughly water settled or tamped, as may be directed by the Superintendent.

(408) Removal of Earth: After all back filling, as hereinabove specified, the ground shall be left level and all remaining earth shall be removed by this Contractor as may be directed by the Superintendent.

(409) System: Steam and hot water for heating system and domestic water supply is to be generated in two (2) low-pressure heating boilers and one hot water boiler. These boilers are to be fired with crude oil with supply tank located just outside of Boiler Room. The building is to be heated by direct steam radiation. The ventilating systems are for ventilation alone, the heaters where shown in connection with these systems being just of sufficient capacity to permit delivery of fresh air to the rooms at a temperature of about seventy (70) degrees Fahrenheit, or slightly above.

The distributing and return mains shall be run as indicated on drawings.

(410) Heating Boilers and Fittings: Furnish and install, where located on drawings, two (2) Pacific Double Return Tubular, Portable Type, Catalog No. Two Hundred Thirty-two (232) Firebox Steam Boilers, or equal, having a total heating surface of not less than nine hundred and seventeen (917) square feet each, and a net cast iron steam radiation rating of not less than eighty-three hundred (8300) square feet each. These boilers, fittings, and appliances attached hereto, shall be constructed according to the rules and regulations of the Industrial Accident Commission of the State of California.

Cast iron boiler substitutions, if offered, shall be based on catalog cast iron steam radiation rating not less than fifty (50%) per cent greater than that specified above for steel boilers.

Each boiler must be completely equipped with all necessary trimmings, including cast iron water column with gauge glass, angle valves, and three (3) gauge cocks; pressure gauge, 8 inch diameter dial graduated to thirty (30) pounds; A. S. M. E. Standard pop safety valve, Ashton or equal, set and locked to blow at fifteen (15) pounds pressure; tube cleaners and handles, blow-off valves and fittings indicated on drawings or hereinafter specified.

(411) Hot Water Boiler: Furnish and install, where located on drawings, one hot water boiler of the type and size indicated on plans. All trimmings to be as indicated on drawings and hereinafter specified.

(412) Boiler Guarantee: This Contractor shall furnish a written guarantee, covering a period of two (2) years from date of acceptance,

from manufacturers of boilers that boilers as installed will produce, without overloading and with steady water level, the amount of steam and hot water specified and that same are free from mechanical and structural defects. This guarantee to stipulate that all repairs necessary to boilers during the two years, due, in the opinion of the State Department of Engineering, to structural defects, will be made by the manufacturer without cost to the State.

(413) Breeching and Flue: Install a properly designed breeching in back of boilers where shown on drawings. Provide in each end of breeching a suitable sixteen (16) inch by twenty (20) inch cast iron explosion door and frame. Breeching shall be constructed of number ten (10) U. S. Standard gauge steel plates thoroughly stiffened and braced with angle or tee irons. All joints shall be tightly riveted and shall be absolutely gas tight. Breeching shall be supported in an approved manner.

Furnish and install, where indicated in the breechings of the three present boilers, suitable dampers, constructed of three-sixteenths ($\frac{3}{16}$) inch steel plates of the proper size and shape and securely fastened to damper rods. Provide each damper with a positive controlling device of approved design, which can be operated from floor in back of boiler.

From concrete slab at basement floor level to approximately thirty (30) feet above sixth floor level, furnish and install oval steel stack of not less than one thousand (1000) square inches cross-sectional area. This stack to be built of Number ten (10) U. S. Standard gauge steel plates securely riveted and absolutely gas tight. Base of stack to be constructed on cast iron base ring set on concrete slab. Install in base of stack on Boiler Room side, sixteen (16) inch by twenty (20) inch cleanout door, fitted with hinge and latch. Door shall close tightly over an opening reinforced with angles.

Where stack passes through roof, the Sheet Metal Contractor will place a copper cap and flashing, but this Contractor shall provide stack with an iron collar to form slip joint as shown on drawing No. 104.

At each floor level guide stack on four (4) sides with one and one-quarter ($1\frac{1}{4}$) inch pipe rollers over one (1) inch rods securely anchored to wall or slab. Stack must clear building construction at all points.

Paint stack and breeching inside and outside with best qualities of heat-resisting stack paint, Oronite Enamel, or equal. One coat to be applied to laps and inaccessible points before erection and two coats applied after erection. The written approval of an authorized agent of State Department of Engineering must be obtained by the Contractor before applying second and third coats of paint.

Contractor shall submit scale drawings, and obtain approval of the State Department of Engineering, showing in complete detail the construction, dimensions, and arrangement of the breeching, stack, dampers, cleanout doors, guides, hangers, base and flashing, before proceeding with the fabrication.

(414) Oil Burners and Oil Pump: This Contractor shall furnish and install complete oil burning equipment for two (2) heating boilers and one (1) hot water boiler, complete with pumping unit and blower, as located on plan. Burners and pump set to be of the Fess System Company's make, or equal, with direct-current 230-volt motor. Each

burner to have a capacity to fire the boiler under which it is located to full rated capacity with a clear, smokeless and carbonless fire and without injury to setting or boiler. Pump and blower set to have a capacity to pump the maximum amount of oil and air required for the three burners to be installed at present and one burner for future boiler of same size as present heating boilers. Burners and pump set to be installed by manufacturer of apparatus complete with automatic protective switch for oil pump set, foundations, piping, fire brick linings, and all necessary equipment to make a complete and modern oil burning installation of the most efficient character. A six (6) inch nickel-plated vacuum gauge and a six (6) inch nickel-plated pressure gauge shall be furnished and connected to suction and pressure side of oil pump. These gauges to be Ashton, or equal, and will be mounted on panel board along with protective switch, all as hereinafter described under "Panel Board and Wiring."

This Contractor to furnish from manufacturer of apparatus a written guarantee covering a period of two (2) years from date of acceptance, that burners as installed will fire boilers as hereinbefore required and that manufacturer will, without cost to the State, repair, replace, or make adjustments to burners and oil set that may be required to maintain guarantee.

(415) Oil Storage Tank and Connections: Furnish and install underground, where indicated on sheets Nos. M-19 and M-20, a black steel fuel oil storage tank fourteen (14) feet long by six (6) feet in diameter. Shell and bumped heads shall be made of one-quarter (¼) inch steel plates. All joints shall be single riveted with five-eighths (⅝) inch steel rivets and shall be made watertight. Minimum lap of plates to be not less than one and seven-eighths (1⅞) inches. All joints shall be thoroughly calked and all openings shall be reinforced. Place in top of shell where shown an eleven (11) inch by sixteen (16) inch Eclipse type manhole with yoke and gasket; also, four (4) flanges as noted on drawings. Tank shall be tested, before setting, in presence of Inspector to a pressure of fifteen (15) pounds cold water. After tank has been tested, paint outside of tank one (1) coat of Oronite Priming Solution, or equal, and follow with one (1) heavy coat of Petrolastic Cement, or equal, applied in exact accordance with instructions of company manufacturing goods.

Tank to set on concrete saddle and protected with concrete walls on sides and ends. Use board forms for both inside and outside surfaces. Concrete to be the same as herein specified for foundations. Run concrete manhole to surface of ground and cap with eighteen (18) inch cast iron manhole ring and cover. Run four (4) inch filler line to curb of sidewalk in rear of building and cap with waterproof cast iron lock box and cover fitted with padlock costing not less than one ($1.00) dollar. Run two and one-half (2½) inch vent up side of building five (5) feet above filler box and cap with return bend. Run suction and return lines as shown with check valve in suction near pump. Test both suction and return lines with twenty (20) inch vacuum in presence of Inspector before covering. Care must be taken to grade both filler and vent lines rapidly to tank so that no oil will lie in same.

All piping in the ground shall be painted the same as specified for oil tank.

(416) Vacuum Pumps: Install in Boiler Room, where indicated on drawings, one (1) Nash Engineering Company's Jennings' Turbine Vacuum and Low Pressure Boiler Feed Pump, or equal, complete with receiver, strainer, separator, relief valve, six (6) inch nickel-plated vacuum gauge, vacuum switch and control. Pump to be direct connected to a 230-volt direct-current motor mounted on cast iron base, all as described and shown in Bulletin Number Eight (8) of Nash Engineering Company. Pump to have capacity to maintain ten (10) inches of mercury vacuum while handling all vacuum returns and delivering water against ten (10) pounds boiler pressure, with ample allowance for future radiation.

Connect vacuum line from building to receiver, water discharge to boilers and air discharge to four (4) inch blow-off vent from sump, all as shown and indicated on drawing.

Wiring and foundation for this pump to be as shown on plans and further described in these specifications. This Contractor to furnish written guarantee from manufacturer that vacuum pumps, as installed, will maintain a vacuum of ten (10) inches mercury at pumps when handling all air and water of condensation from heating system, including the three thousand feet of direct radiation to be installed in the future.

(417) Hot Water Storage Tank: Furnish and install, where indicated in Boiler Room, a black steel hot water storage tank, and all connections complete and ready for service as detailed on Sheets Nos. M-19 and M-20 and as hereinafter specified, making connections to cold and hot water supply pipes where noted on details.

Storage tank shall be fifty-four (54) inches in diameter and nine (9) feet six (6) inches long, and shall be mounted on concrete piers as detailed.

Tank shall have one-quarter (¼) inch steel shell and three-eighths (⅜) inch steel bumped heads. All joints shall be well riveted and calked, and all openings shall be reinforced. Longitudinal seams shall be double riveted lap joint, transverse seams single riveted lap joints. Tank shall be tested to one hundred and fifty (150) pounds per square inch cold water pressure by the maker or by this Contractor, who shall neatly stamp into the metal of the head close to the manhole opening, the date of this test and the words, "Tested to 150 pounds." A properly executed certificate of said test shall be delivered in duplicate to the Inspector before tank is installed. Provide an eleven (11) inch by fifteen (15) inch manhole with plate, yoke and gasket in center of one head where shown. Provide tappings in tank of sizes and locations shown. Both of the two (2) inch tappings in the head for the steam coil connections shall be wrought steel double hub flanges, tapped from both sides with axis of tappings parallel to axis of tank. These double hub tappings may be made by welding extra strong pipe couplings into the head with an ample lump of metal at the joint to strengthen same. No heating coils will be installed in tank at present, but all connecting tees and tappings must be left for same.

Install in hot water line where shown a three-quarter (¾) inch hot water separable mercury thermometer graduated from forty (40) degrees to two hundred and forty (240) degrees Fahrenheit, as manufactured by C. J. Tagliabue Manufacturing Company, or equal. Install on top of tank, complete with discharge pipe to floor, a one (1) inch spring pattern standard brass angle safety relief valve, Lunkenheimer Fig. 288, or equal.

(418) Clock: Furnish to Electrician for mounting on board one (1) eight (8) day Seth Thomas, or equal, nickel-plated clock, with dial not less than eight (8) inches in diameter.

(419) Panel Board and Wiring: All electric wiring in Boiler Room will be furnished and installed by Electrical Contractor, but this Contractor must make terminal connections to his apparatus and will be responsible for direction and satisfactory operation of motors and control.

This Contractor shall furnish to Electrical Contractor the following apparatus hereinbefore and hereinafter specified:

1 clock.
1 oil pump protective switch.
1 vacuum pump switch and control complete.
1 air compressor control switch.
5 pneumatic valve controls.
5 nickel-plated, six (6) inch back connected gauges.

The Electrical Contractor will mount this apparatus on panel board furnished and set by him in Boiler Room.

All pipe connections to apparatus on panel board are to be made by this Contractor and due care shall be taken to maintain ample clearance between pipes and electrical conductors.

All knife switches for Boiler Room motors will be furnished and mounted on panel board by Electrical Contractor.

All apparatus on this board to be distinctly labeled in an approved manner.

(420) Foundations: The foundations for all apparatus in Boiler Room and tank pit shall be furnished and installed by this Contractor. No foundations will be required for boilers.

All foundations shall be made of concrete consisting of one (1) part of cement, two (2) parts sand and four (4) parts crushed rock. The heights of all foundations, relative to finished floor, shall be as shown on drawings and shall be of ample size for the apparatus for which they are intended. When forms are removed from foundations, finish exposed surfaces with one-half (½) inch cement plaster, troweled smooth.

(421) Blow-Off Basin: Furnish, excavate for, and install, where located on drawings, one (1) twenty-four (24) inch diameter by thirty-six (36) inch deep cast iron blow-off basin with cover flush with floor, James B Clow & Son's Plate A-2688, or equal. Pipe connections to be of sizes shown on drawings. Run four (4) inch screwed pipe vent from same through roof with suitable guides, anchors and flashing. Sewer connections from blow-off basin to be installed by Plumbing Contractor.

(422) Oil Meter: Install on discharge side of oil pump one (1) one (1) inch Worthington Oil Meter, or equal, with vertical dial reading in U. S. gallons. Install valved bypass around meter.

(423) Water Meter: Furnish one (1) Trident, or equal, three-quarter (¾) inch hot water meter with a safe maximum delivery of thirty-five (35) gallons per minute. This meter is to be equipped with fittings so that it may be set into any one of the by-passes of the return lines with the tightening of two unions.

At points below boiler water level in vertical drop of return lines, install gate valves of size of line in which located. Above and below each valve install tees with three-quarter (¾) inch bull-headed outlet. In each of these outlets place three-quarter (¾) inch gate valve and one-third of union. The other two-thirds of union to be on water meter set. These fittings in each case must be so placed that water meter can be set horizontally into any one of by-passes and that unions will fall into true seat without straining.

(424) Piping: All piping used in the installation of the work covered by these specifications, except exposed piping in Boiler Room, shall be new, "full weight," black, genuine wrought iron pipe, Byer's or equal, of sizes shown, and shall be free from all dents, fins, kinks or burrs. All piping above three (3) inch shall be lap welded. Ends of pipe shall be reamed to the full inside diameter and beveled. Care must be taken to clean the interior of all piping before erection. Offsets, without fittings, wherever required, are to be made of extra heavy lap weld pipe bent at red heat.

All exposed piping in Boiler Room shall be National Tube Co.'s, or equal, new, "full weight," black wrought iron or mild steel pipe.

(425) Fittings: All fittings for the work covered by these specifications shall be National Tube Company's, or equal.

All couplings shall be "full weight" wrought iron couplings.

All other fittings shall be standard cast iron fittings made of sound, fine-grained, gray cast iron, uniform thickness throughout, concentric and finished smooth inside and outside. All screwed fittings shall be flat-banded, recessed fittings. All flanged fittings shall be faced and drilled. All drilling to be done in accordance with the "American Standard" templates for drilling standard flanged fittings.

The entire supply header in Boiler Room shall be made up of flanged fittings and companion flanges. The six (6) inch supply header to attic shall be flanged until its vertical rise. The vertical portion of six (6) inch header and all other steam piping in building except as otherwise detailed on plans or mentioned in specifications, shall be screwed fittings. The horizontal flange on elbow at base of six (6) inch rise to attic must be turned thick on throat side to allow one-quarter (¼) inch in ten (10) feet drop in horizontal line to header.

All unions two (2) inches and smaller shall be heavy ground joint unions with octagon head, tail and nut to meet the United States Government specifications. All unions two and one-half (2½) inches and larger shall be standard flanged.

(426) Joints: Wherever possible, all flanged pipe shall be made up in shop. Flanges shall be screwed on by power, after which pipe

shall be thoroughly pinned into same, and pipe shall be reamed to remove all burrs. Pipe shall then be swung in lathe and flanges faced square with pipe. Drilling of flanges shall then be done as hereinabove specified. All flanged joints shall be made up with gaskets cut from Garlock Packing Company's No. 900, or equal, sheet packing one-sixteenth (1/16) inch in thickness.

All screwed joints shall be made up with boiled linseed oil and ground graphite.

All threads must be cut straight and true.

(427) Valves: All straight-way valves, sizes two and one-half (2½) inch and larger, except where otherwise noted or specified, shall be standard valves with iron bodies, brass trimmings and wedge gates, Pratt & Cady Fig. 122, or equal. All straight-way valves, two (2) inch and smaller, shall be brass, with wedge gate and gland, Pratt & Cady Fig. 86, or equal. All globe valves, except where otherwise indicated or specified, shall be standard brass globe valves, Pratt & Cady Fig. 1.

All check valves shall be standard brass swing check valves, with renewable composition discs, Jenkins Bros.' No. 352, or equal.

(428) Thermostatic Traps and Bleeding Sets: Where indicated on the heating diagrams, condensation shall be trapped from the distributing mains into the vacuum return through thermostatic traps, Haines Model "1908," or equal, of sizes shown and designed for fifteen (15) pounds working pressure. Same shall be installed complete with mud legs, valves and by-passes, all as detailed on Sheet No. M-18.

Condensation from heater stacks in basement and fifth floor shall be trapped into the vacuum return through one-half (½) inch "Haines Model 1908 Vacuum Traps," or equal, for not to exceed fifteen (15) pounds working pressure. The stack in basement will require one trap and the stack on fifth floor will require two traps.

All radiators shall be connected to vacuum return line through C. A. Dunham, or equal, vacuum return line radiator valves, angle pattern, of proper sizes.

(429) Guarantee for Air and Vacuum Valves: This Contractor will be required to furnish from the manufacturers a five-year guarantee, in writing, of all traps and air valves. This guarantee to stipulate that all valves furnished will operate satisfactorily, as installed, for a period of five years, and any repairs and replacements necessary will be furnished and installed without cost to the State.

(430) Valves on Radiators: All radiators except in entrance lobby to be provided with Pratt & Cady Company's Radiator Valves, Fig. 8, or equal, with male unions, hard metal stems, black hardwood wheels, rough body nickel plated all over. All valves shall be angle patterns. Sizes of valves shall be as indicated on drawings.

(431) Connections to Radiators: All radiators shall be connected with two-pipe vacuum system and care must be taken that the connections are given a uniform slope from radiators and so arranged that they cannot be trapped by the expansion of either mains or risers.

Risers and branches to radiators shall in all cases be of sizes indicated on the diagrams. Reductions, if any, to size of connections to radiators shall be made at the fitting nearest the radiator valve.

(432) Radiators: The location, height and size in square feet of radiating surface of all radiators about the building are shown on the heating diagrams. Where radiators are located in front of windows, they shall in no case extend above the sill of the window. Locations given shall be followed throughout unless express permission for change is given in writing by the State Department of Engineering, and sizes shall not be less than indicated.

All radiators shall be of the steam pattern, American Radiator Company's, or equal, of types as noted on the drawings, tapped for vacuum return.

Steam shall be blown through the radiator sections for several minutes at the time of assembling same in order to insure a perfectly clean interior, free from corings and grit.

Wall radiators in basement shall be firmly supported, using American Radiator Company's wall radiator brackets, Styles "L" and "MM," screwed to two (2) inch by four (4) inch wood grounds extending full height of radiator and securely anchored in wall.

This Contractor will be required to install radiators temporarily, as directed by the Superintendent, and maintain steam in the boilers during working hours for the purpose of drying out the building. Fuel oil and electricity will be furnished by the State. When directed by the Superintendent, this Contractor is to disconnect radiators to allow laying of linoleum or for other purposes, and reconnect same when so directed.

(433) Securing Piping: All piping throughout the system shall be firmly secured with proper allowances for expansion and contraction, the expansion and contraction being compensated for by right angle turns with swing elbows. Whenever suspended hangers are used, all supports must be arranged to prevent swaying. The spacing of points of suspension or support shall in no case exceed ten (10) feet. All hangers shall be set to allow for the expansion and contraction of the pipe lines without straining the pipe or hangers. Except where otherwise indicated or specified, use Falls "Lock Hinge" hangers, or equal, and extension bar; No. 1 bar (seven-eighths (7/8) inch wide, No. 14 U. S. Standard Gauge) for three-quarter (3/4) inch to one and one-half (1½) inch pipe; No. 2 bar (one (1) inch wide, No. 12 U. S. Standard Gauge) for two (2) inch to three (3) inch pipe; No. 3 bar (one and one-eighth (1⅛) inch wide, No. 12 U. S. Standard Gauge) for three and one-half (3½) inch to six (6) inch pipe; and No. 4 bar (one and one-quarter (1¼) inches wide, No. 12 U. S. Standard Gauge) for seven (7) inch to eight (8) inch pipe. Where said hangers occur under concrete slabs, the extension bar above specified shall be hung from suitable steel loops, as detailed, which must be accurately placed in the forms before the concrete is poured.

Hangers must be placed on all branches, where required by Inspector, securing same to proper grade before any radiator connections are made.

(434) Pipe Anchors: Pipe anchors shall be located at points indicated on the Heating Diagrams and shall be constructed and installed complete as indicated, detailed or noted on the drawings.

(435) Risers: All risers shall be run concealed in chases provided for that purpose. These must be run, tested and covered before interior tile walls are placed.

(436) Pitch: In all work hereinbefore and hereinafter specified, the supply and return mains shall have a pitch of not less than one-fourth (¼) inch in ten (10) feet. All branches to have a pitch of not less than one (1) inch in ten (10) feet.

(437) Closing of Piping: This Contractor shall, as fast as his pipe lines have been installed, cap or plug all openings with standard cast iron caps or plugs, to prevent the entrance of any materials that would obstruct the pipes. These caps and plugs shall be left in place until their removal is necessary for the setting of the radiators.

(438) Closing in of Uninspected Work: This Contractor shall not allow or cause any of the work installed under these specifications to be covered up or enclosed before it has been inspected, tested and approved by the State Department of Engineering. Should any of the work be enclosed or covered up before it has been approved by said Department of Engineering, he shall, at his expense, uncover the work and, after it has been inspected, tested and approved, make all repairs necessary to restore the work of other contractors to the condition in which it was found at the time of the cutting.

(439) Testing of Pipes: All piping installed by this Contractor shall be tested by closing all openings and subjecting the different lines to a water pressure of one hundred (100) pounds per square inch, which pressure must be maintained without fluctuation of a gauge for a period of not less than one (1) hour, or longer time, as may be required by the Superintendent to make a complete examination of that portion of the system being tested, without additional pumping.

(440) Non-Conducting Covering: All steam mains, concealed returns, radiator arms and risers, and such portion of the hot water piping as is installed in Boiler Room shall be covered with 85 per cent carbonate of magnesia sectional moulded covering of standard thickness, as follows:

Pipe size ½ inch to 1½ inch, wall of covering shall be ⅞ inch thick.

Pipe size 2 inch to 3½ inch, wall of covering shall be 1 1/32 inches thick.

Pipe size 4 inch to 6 inch, wall of covering shall be 1⅛ inches thick.

Pipe size 7 inch to 10 inch, wall of covering shall be 1¼ inches thick.

All exposed portions of boilers and hot water tank, except doors, shall be covered with 85 per cent magnesia blocks two (2) inches thick, finished with one-half (½) inch of magnesia plastic. Blocks shall be securely wired to boiler and tank before applying plastic. Covering

shall be beveled to doors and cleanout holes in a neat and workmanlike manner.

All fitting in mains and concealed steam piping shall be neatly covered with 85 per cent magnesia plastic of thickness as hereinbefore specified. The finishing coat shall be smoothly troweled and finished with a canvas jacket to match the sectional covering. Covering shall be omitted on flanges and unions.

All pipe, boiler and tank covering shall be neatly finished with six (6) ounce drill jackets smoothly and securely pasted on with H. W. Johns-Manville Dry Powder Paste, or equal. On all pipe covering place brass lacquered bands three-quarters (¾) inch wide at the rate of two bands per section of pipe covering. Bands shall not be applied until after paint has dried.

All galvanized iron ducts carrying heated or tempered air, heater housings, and outlet heads shall be covered with two coats of ten (10) pound asbestos paper smoothly pasted on with J. M. Dry Powder Paste.

Cover all exposed portions of smoke breeching with one (1) inch 85 per cent magnesia blocks securely wired in place over three-quarter (¾) inch "V" rib lath, and finished to a true, hard surface, with 85 per cent magnesia cement and six (6) ounce drill jacket pasted over same. The insulation is to be applied free from the pipe, and left open at both ends to permit free circulation of air.

(441) Insulation and Protection: All insulation, protection of woodwork, etc., from heat of pipes shall be done in accordance with the rules and regulations of the National Board of Fire Underwriters, as last amended.

(442) Floor, Ceiling and Wall Plates: Provide nickel-plated, solid, one-piece cast iron floor, ceiling and wall plates for all exposed work. Wall and ceiling plates to have set screw.

(443) Location of Pipes: This Contractor shall confer with other Contractors installing pipes and shall be governed by conditions existing in each case.

(444) Ventilating Systems: The system to be used is a plenum blast system with mechanical exhaust for large court room. There shall be three separate systems aside from ventilating sets for toilet room shown and specified on drawings: one for two hearing rooms on first floor; one for two court rooms on fourth floor; and one for Law College on sixth floor. These systems in each case are for ventilation only, the heaters in connection with these systems being just of sufficient capacity to permit delivering the fresh air to the rooms at a temperature of about seventy (70) degrees Fahrenheit, or slightly above. The apparatus for the first floor shall be located in basement, the supply fan and heater for fourth floor shall be located on the fifth floor, and exhaust fans for the fourth floor shall be located in attic above the fifth floor ceiling. The apparatus for the sixth floor shall be located in attic above.

All shafts, furred spaces, openings for ducts, registers, etc., will be cared for by another contractor, who will also furnish and install all

registers, valved registers, and grilles, but this Contractor will locate openings for same.

(445) Ventilating Fans: Furnish, deliver and erect in location as shown on plans, three (3) full housed, overhung pulley, multi-blade fans and two disc fans, as follows:

One (1) for the two hearing rooms on the first floor to be single width, single inlet, top horizontal discharge, having a capacity of one thousand (1,000) cubic feet per minute with a maximum speed of five hundred and eighty-eight (588) revolutions per minute, and a maximum tip speed of two thousand (2,000) feet per minute—Number two (2), design three, B. F. Sturtevant, or equal. One for the Supreme Court and Appellate Court on the fourth floor to be single width, single inlet, top horizontal discharge having a capacity of five thousand (5,000) cubic feet per minute with a maximum speed of three hundred and twenty-four (324) revolutions per minute and a maximum tip speed of two thousand (2,000) feet per minute—Number six (6), design three (3), B. F. Sturtevant, or equal.

One for the three Law College rooms on the sixth floor to be single width, single inlet, top horizontal discharge having a capacity of twelve hundred (1,200) cubic feet per minute, with a maximum speed of six hundred and forty-six (646) revolutions per minute and a maximum tip speed of twenty-two hundred (2,200) feet per minute—Number two (2), design three (3), B. F. Sturtevant, or equal.

Two for the Supreme Court room on the fourth floor to be a two hundred and thirty (230) volt, vertical direct connected, twelve hundred (1,200) revolutions per minute disc fans, with a capacity of eleven hundred (1,100) cubic feet per minute each—B. F. Sturtevant No. 3 Tractrix, or equal. All of the above fan capacities shall be measured against the actual resistance of the system.

These fans, except disc fans, shall be of the overhung pulley, full housed type. The casings shall be made of heavy steel plate thoroughly braced, bolted and riveted so as to prevent all vibration.

The fan wheels are to be substantially constructed on heavy spiders, having structural steel arms securely fastened into cast iron hubs, and well balanced so as to run free from vibration. They are to be hung on shafts of large diameter, which have ring oiling or chain oiling boxes of the adjustable type. The entire fan installation shall operate noiselessly under all conditions.

The fan shafts shall be provided with cast iron or steel pulleys of proper diameters and widths to correspond with the motor speeds and belt drives hereinafter specified.

The fans shall be securely bolted to the foundations, one (1) inch thickness of best hair felt being placed between fan foot-rails and said foundations.

Contractor shall also furnish, deliver and erect fans for ventilating toilet rooms as shown and specified on drawings.

(446) Motors: Each fan, except disc fan and fans for toilet ventilating sets, shall be belt driven by an independent General Electric Type R. C., or equal, direct-current motor complete with grooved pulley and sliding base. Said motors shall be furnished and installed where shown and shall be wound for 230-volt direct current.

Motors must be of ample capacity for the continuous operation of fans under the actual conditions without heating or other signs of overload.

Motor for driving the basement fan shall be not less than one-quarter (¼) horsepower and shall be shunt wound for a speed not to exceed eight hundred and fifty (850) revolutions per minute.

Motor for driving the Law College fan in the attic shall be the same as that for driving the basement fan.

Motor for driving the fan on the fifth floor shall be not less than one (1) horsepower and shall be shunt wound for a speed not to exceed eleven hundred and fifty (1150) revolutions per minute.

This Contractor shall furnish a 30-ampere, double pole, fused, externally operated switch, General Electric Company's Type LM-1, or equal, and totally enclosed G. E. C. R. No. 1,001, or equal, rheostat for fifth floor fan; but no control will be required for basement and attic fan motors.

All motors shall have approved terminal for connection to flexible conduit.

Motors, switches, etc., for toilet ventilating sets shall be as specified on drawings.

(447) Wiring: The Electrical Contractor will furnish all control and wiring to basement fan motor and three attic fan motors, wiring for fifth floor fan motor and fan motors for toilet room ventilating sets. This Contractor will be required to connect leads to motors and will be responsible for direction and satisfactory operation of motor.

The Electrical Contractor will leave outlet where located by this Contractor for rheostat on fifth floor motor.

The Ventilating Contractor shall give the Electrical Contractor exact locations of all motors in order that conduit lines to same may be properly placed.

All motors, controls and apparatus furnished by this Contractor shall be of type approved by Industrial Accident Commission, and a certificate of inspection from San Francisco local authorities shall be furnished wherever required.

(448) Belting: Furnish and install for driving all fans except exhaust fans, Graton & Knight Manufacturing Company's Spartan Block Type V Belts, or equal, with sheaves of diameter and size as recommended by manufacturer of belt. Belts to be not lighter than single strand three (3) ply, three-quarter (¾) inch wide.

(449) Heaters and Casings: From fan outlets to heater casings in basement, fifth floor, and attic, construct Number Twenty-two (22) U. S. Standard gauge galvanized iron connections insulated from fan with canvas connections not less than six (6) inches long. Heater casings on two sides, top and bottom, to be No. 22 U. S. Standard gauge, with standing one (1) inch seams running vertically and horizontally, spaced not to exceed eighteen (18) inches apart. Casings in all cases to be supported from foundation and free from heaters. Transitions from casings to ducts to be of No. 22 galvanized iron well braced with standing seams to avoid all vibration.

Heaters shall be of the "blow through" type, consisting of Vento Cast Iron Hot Blast Heater Stacks, or equal. The stacks in basement

and attic are to be built up of thirty (30) inch sections, eight (8) square feet per section, set on five and three-eighths (5⅜) inch centers. The stack on fifth floor to be built up of forty (40) inch sections, ten and three-quarters (10¾) square feet per section, set on five and three-eighths (5⅜) inch centers. Stack shall be staggered and shall be carried on two (2) one-quarter (¼) inch by two (2) inch tee irons, supported as shown on drawings.

Heaters in basement and attic shall consist of two (2) stacks each, with three sections per stack, making a total heating surface of forty-eight (48) square feet each.

Heater for fifth floor shall consist of two (2) stacks with seven (7) sections per stack, making a total heating surface of one hundred and fifty and one-half (150½) square feet.

After heater stacks have been assembled, same shall be tested and made tight under a cold water pressure of fifty (50) pounds per square inch gauge.

(450) Ducts: All ducts, unless otherwise indicated or specified, are to be constructed of galvanized iron, using No. 22 U. S. Standard gauge for all ducts of four (4) square feet area and over and No. 24 U. S. Standard gauge for all ducts of less than four (4) square feet area.

All joints between galvanized iron duct sections to be made up with Government clips, wherever possible to do so. All seams and joints, where the Government clips cannot be used, shall be riveted airtight.

All ducts must be thoroughly stiffened with standing seams so that when they are carrying maximum quantity of air, under maximum pressure no vibration shall be imparted to ducts. All changes in direction shall be made along easy curves, no right angle turns being permitted. Indicated radii shall be followed in all cases. No branches shall be taken out at angles exceeding thirty (30) degrees with line of air flow.

All ducts shall be firmly secured in place, using perforated wrought iron strap hangers, no wire hangers being allowed. Points of support shall in no case be spaced more than five (5) foot centers.

(451) Diffusing Vanes: Diffusing vanes shall be constructed in ducts and connections to outlets, as shown on drawings. Same shall be made of No. 22 U. S. Standard gauge galvanized iron and shall be firmly and securely riveted in place.

(452) Dampers in Ducts: Furnish and install, where indicated on drawings, galvanized iron volume dampers of No. 22 U. S. Standard gauge galvanized iron. Same shall be constructed and installed complete as detailed and noted on Sheet No. (M-18).

(453) Canvas Connections: All connections between fans and plenum chambers shall be made with ten (10) ounce canvas ducts six (6) inches long, with substantial iron frames, all complete as detailed and noted on Sheet No. M-18. Canvas to be well sized and painted two (2) coats as directed.

(454) Adjustment of System: Upon completion of erection, the entire system must be adjusted so as to be in first-class operating condition in every respect. All splits and dampers shall be set in such a

manner as to give the indicated discharge through all fresh air grilles. During the setting of same, all doors and windows shall be kept closed and all measurements of air velocities shall be made with accurately adjusted anemometers. This work shall all be done in the presence and to the complete satisfaction of an authorized representative of the State Department of Engineering, and after same is completed, all dampers shall be securely clamped in place by means of the pipe plugs provided. Said representative of the State Department of Engineering shall then take all measurements necessary to accurately locate all damper controls, recording said measurements on prints of Ventilating Diagrams, which shall be filed with said Department of Engineering.

(455) Automatic Regulation: Furnish and install Johnson System of Temperature Control, or equal, for the three heating stacks hereinbefore specified. This system to be installed by the manufacturers of the apparatus, and to be guaranteed by them for a period of five years.

The system for each of the three ventilating sets to consist of: one (1) Johnson Service Company's Positive Model Thermostat enclosed in Model "P. I." cover located by regulation contractor and location approved in writing by State Department of Engineering; one (1) sylphon valve located on steam supply to heater stack of size indicated on drawings, complete with all piping necessary for satisfactory operation of system.

Furnish and install air compressor where located in Boiler Room; same to be Johnson's, electric belt driven, Type 3-inch by 3-inch A. with Johnson's Electric Governor Switch, or equal, all for 230-volt direct current. Control switch and six (6) inch nickel-plated gauge to be furnished to Electrical Contractor, who will mount same on Boiler Room board as hereinbefore specified. Piping connections to be made by this Contractor.

Furnish and install, where located on plans, one eighty (80) gallon galvanized steel storage tank complete with safety valve and drain cock. Tank to be tested to one hundred (100) pounds hydrostatic pressure by manufacturer and plainly stenciled, "Tested to 100 pounds." Tank to be set vertically on neat concrete foundation and securely strapped to concrete wall.

The system of temperature control on the three heater stacks, when complete, to be guaranteed to regulate the temperature within one (1) degree of the predetermined point when the entering air is below the required temperature.

(456) Pneumatic Valve Control: Furnish and install in steam distribution system at points indicated on plans, five Johnson Sylphon Pneumatic Steam Valves of size indicated on plans with Johnson Pneumatic Switch Control, or equal. Switch controls to be of the switchboard type, nickel plated, each marked showing the locality of risers they control. These five switch controls to be furnished to Electrical Contractor, who will mount same on switchboard in Boiler Room as hereinbefore described. This Contractor to make all connections to same.

The attention of this Contractor is called to the fact that these five controls will be mounted on one and one-quarter (1¼) inch slate board and that the switch controls must be long enough to connect through this board.

This switch control when complete to be guaranteed for a period of five years to open and close steam lines satisfactorily and any repairs for same are to be furnished and installed without cost to the State of California.

(457) Painting and Bronzing: All piping, pipe hangers, supports, covering, etc., exposed under first floor shall be painted two coats of lead and oil paint of an approved make, color to be selected by the Inspector.

All other pipe hangers, supports, anchors, and guides, all mud legs and receivers for bleeding sets, all uncovered piping not hereinafter specified as being bronzed, and such parts of the boilers, heater, flanges, etc., as are not covered shall be given two coats of the Standard Oil Company's "Oronite" enamel paint, or equal. This Contractor shall paint all piping, covering, etc., installed in the Boiler Room by the Plumbing Contractor as well as the work installed under this contract.

All non-conducting covering in Boiler Room shall be given one coat of size made of H. W. Johns-Manville dry powder paste, after which it shall be given two coats of lead and oil paint of an approved make, color to be selected by the Inspector. All other pipe covering shall be given one coat of size and two coats of H. W. Johns-Manville Company's white "Asbestos Fibre Proof Paint," or equal.

All radiators and exposed radiator connections and all uncovered piping, excepting in basement and Boiler Room, shall be finished with W. P. Fuller Company's Radiator Bronze, using "Bavaria" Bronzing Liquid No. 2 as a medium, or such equivalent finish as may be approved by the State Department of Engineering, applied over one (1) coat of approved yellow mineral paint. All surfaces so finished must be thoroughly cleaned and brushed with stiff wire brush before said finish is applied.

Pipe railing around boiler pit, and ladder shall be painted one coat of red lead and two coats of an approved make of lead and oil paint, color to be selected by the Inspector.

All paint shall be applied of the consistency regularly supplied and recommended by the manufacturer. All surfaces to be painted shall be dry before painting, the metal surfaces being thoroughly cleaned and brushed with stiff wire brushes before paint is applied. The first coat shall be inspected and approved by the Inspector and allowed to dry before the second coat is applied.

(458) Guarantee: This Contractor shall guarantee that a continuous circulation of steam shall be established throughout the heating system at atmospheric pressure or below same, and that there will be no hammering or surging of water in any part of the system, and also, after circulation is established, the system will do all the heating under this specification. He shall further guarantee that all apparatus installed under this specification shall fulfil all the requirements herein specified for the same. He shall be responsible for all work put in under this specification and shall make good, repair or replace, at his own expense, as may be necessary, any defective work, material or parts which may show itself within one (1) year from and after the date of final certificate, if, in the opinion of the State Department of Engineering, such defect is due to imperfection in workmanship, or materials as specified.

Electrical Work

Note—Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(459) Scope of Work: The Contractor for this work shall furnish all transportation, all skilled and common labor, all apparatus and material required for the complete installation in every detail of underground service, switchboard equipment, light and power wiring, control apparatus and equipment and certain portions of the illuminating, telephone, telegraph and fire alarm equipment, all as herein specified and as required by the electric wiring plans and diagrams accompanying these specifications and the architectural plans and drawings.

It is further understood and agreed that all schedules are approximate only with reference to the number of circuits, number of outlets, etc., and this Contractor is to check same with plans, as he will be held responsible for the complete equipment of all panel boards, fixture outlets, etc., in accordance with the plans and specifications.

Should changes in the building during construction necessitate changes (either deductions or additions) in the electrical work, this Contractor is to submit to the State Department of Engineering drawings in triplicate, as called for under working drawings, together with specifications describing the same and a bill of actual cost of material and labor, to which shall be added a reasonable percentage of profit covering the cost of such changes (either deductions or additions), for approval of the State Department of Engineering, before proceeding with the work.

The Contractor for this portion of the work, as contemplated under these plans and specifications, must familiarize himself both as regards the portion of the work covered by his bid and such other work as must be carried on in conjunction therewith in order that the material be properly installed with no delays.

The plans and specifications are intended to mutually explain each other, and anything which is shown on any plans or drawings, either architectural, mechanical or electrical, and not mentioned or referred to in the specifications, or which is referred to in the specifications and not shown on the drawings, shall be considered as being both so shown and mentioned and shall be done and performed accordingly without extra charge.

In case these plans and specifications are in any part deficient or not clearly understood, the bidder shall apply to the State Department of Engineering for the required information before such bids are submitted.

These plans and specifications shall be fulfilled in the true spirit and intent and any apparatus or appliance essential to the proper and convenient operation of the system shall be supplied and installed even though not specially called for.

The furnishing and installation of the fixtures and lamps are not included in this contract, with the exception of outlets in the Supreme Court Room and as hereinafter specified.

The motor control equipment will be furnished and delivered to this Contractor by others, as hereinafter specified.

The telephone equipment with the exception of the conduit, cabinets and outlet boxes, will be furnished and installed by the Telephone Company.

Doors and trims for the telephone and lighting cabinets located in walls of rooms and wire moulding in rooms and corridors will be furnished and set in place by another contractor.

(460) Drawings: Architectural and mechanical drawings shall be consulted, together with the electrical drawings, to eliminate possible errors and to facilitate construction.

(461) Unit Prices: Each bidder shall submit with his bid, a schedule giving the prices of material and labor as specified below. Prices shall cover cost of material installed and connected up complete and ready for service, as an addition or deduction from the work as described in these specifications and shown on the accompanying drawings. Bids not accompanied by this schedule will not be considered.

a. Price per foot of iron pipe conduit of sizes one-half (½) to three and one-half (3½) inches inclusive.
b. Price per foot of single-braided, rubber-covered wire, sizes No. 14 to No. 8 inclusive.
c. Price per foot of double braided, rubber-insulated cable, sizes No. 6 to No. 1, inclusive, and double-braided, cambric-insulated, sizes one-naught (1-0) to six hundred thousand (600,000) circular mil, inclusive.
d. Price per foot of lead-covered, cambric-insulated cables, sizes four-naught (4-0) to six hundred thousand (600,000) circular mil, inclusive.
e. Price of each style and size of outlet box as herein specified.
f. Single, double pole and three-way push button switches with plate.
g. Wall receptacle with plate and attachment plug.
h. Floor outlet complete as specified.
i. Price per hour for journeyman electrician's labor.
j. Price per hour for labor of electrician's helper.

(462) Storage: Space will be allowed this Contractor for the storage of his materials, but he shall provide all necessary enclosures and shall be solely responsible for the safekeeping of all materials and tools stored therein.

(463) Cutting, Patching and Excavation: Ample spaces are provided in the design of the building for the installation of the electric work. Any other openings or spaces found necessary, shall be arranged for by this Contractor with other contractors and in proper time to prevent unnecessary cutting.

This Contractor shall do all cutting or excavating necessary in connection with his work and shall make repairs in a satisfactory manner to any work affected.

All work under this heading shall first have the approval of the State Department of Engineering before being undertaken.

(464) Painting: All railings, grilles, switchboard frames and all exposed conduit, pull boxes and other ironwork installed by this Contractor shall be carefully cleaned and given two coats of lead and oil paint of colors approved by the State Department of Engineering. All galvanized iron to be painted shall be first primed with Guheen Manufacturing Company's "Galvanum," or equal.

(465) Grounding: Service neutral, conduit, cable sheaths, motor frames, switchboard frames and all exposed metal work, subject to contact with conductors of electricity, shall be permanently and effectively grounded, in an approved manner.

(466) Rules and Regulations: All work and materials shall be in full accordance with the orders of the Industrial Accident Commission and with the latest rules of the National Board of Fire Underwriters and the Department of Electricity of the City and County of San Francisco. This Contractor shall be governed by all City Ordinances, all State, Federal and other laws and regulations, pertaining to this work.

This Contractor shall obtain all necessary permits and certificates of inspection and shall pay all fees and charges connected therewith. Upon completion of the work he shall deliver to the State Department of Engineering a satisfactory "Certificate of Inspection" from the Department of Electricity of the City of San Francisco and from the Board of Fire Underwriters of the Pacific.

(467) Supervision: This Contractor shall personally, or through an authorized and competent representative, constantly supervise the work, from its beginning to its completion and acceptance. He shall, so far as possible, keep the same foreman and workmen on the work from commencement to completion.

(468) Inspection: All work and material covered by these specifications shall be subject to inspection, at any time, by representatives of the State Department of Engineering.

Should any material not conform with the specifications and drawings, this Contractor shall, upon order of the State Department of Engineering, immediately remove the rejected material from the premises.

Any material not installed in a neat and workmanlike manner and according to specifications, shall, upon order of the Department, be removed by the Contractor and replaced in a satisfactory manner.

This Contractor shall have all switchboards and panel boards inspected during construction by a representative of the Department of Engineering, and if built other than locally, he shall pay all expenses of such inspection.

Any work closed in or covered up before inspection and approval by the above-mentioned authorities and the State Department of Engineering shall be uncovered by this Contractor and, after inspection and approval, he shall repair all damage at his expense.

(469) Tests: The State Department of Engineering will make, from time to time, tests of any part of the work or equipment installed, which they consider necessary, to ascertain if in accordance with the specifications. The Contractor shall extend to the Department all

facilities to this end and shall furnish any skilled or unskilled help required.

When the entire electrical equipment has been in regular and successful operation for one (1) month, in a manner satisfactory to the Department of Engineering, a complete test of the entire installation will be made.

Materials will be tested as described under the separate headings.

(470) Guarantee: The Contractor shall be responsible for all work done and material installed under these plans and specifications and shall repair or replace as may be necessary any defective work, material or part which may show itself within one (1) year of the date of final completion, if, in the opinion of the State Department of Engineering, said defect is due to imperfections of workmanship or material. This guarantee must be submitted in writing and approved by the State Department of Engineering before the date of final payment.

On failure to comply with the above guarantee within a reasonable length of time after notification is given, the State Department of Engineering shall proceed to have the repairs made at the Contractor's expense.

(471) System of Distribution: The system for the distribution of lighting shall be three-wire, 118 to 236 volts for service and feeders, and 118 volts, two-wire for all branch circuits.

All energy is brought through service mains below basement floor to the main switchboard on which are located switches and fuses controlling each and every feeder. From the main switchboard, feeders supply each switchboard and panel board, which in turn supply local circuits reaching every outlet.

The lighting outlets are divided into five groups, consisting of general illumination, corridor lighting, night lights, entrance outlets and public toilet lighting. Each group is controlled by independent feeders from the main switchboard as shown on the riser diagram and as indicated in the feeder schedule. The system of designation of the various switchboards, panel boards, feeders and circuits is given in the legend.

(472) List of Materials and Substitutions: Within twenty (20) days after the award of the contract, this Contractor must submit to the State Department of Engineering a complete list, in triplicate, of all materials to be installed under this contract, giving, in the case of each item of material to be used, the name of the manufacturer and the trade name, or catalog number of the article. Samples in duplicate, tagged with complete description of the same, must be submitted at this time of all materials to be substituted. The State Department of Engineering shall be the sole judge as to the equality of any substitution offered. No work affected by any article shall be proceeded with until the same shall have been approved in writing by the State Department of Engineering. In no case will any substitute for the materials specified be considered or allowed after this date. Attention is called to the fact that certain materials will be required for installation as soon as construction is commenced, and the above list of materials should be submitted as soon as possible.

(473) Samples: Within thirty (30) days after the award of the contract, this Contractor shall submit to the State Department of Engineering at Sacramento, samples as follows:

a. Samples of conduit two feet long, two each of sizes one-half (½) and two (2) inch, with manufacturer's and underwriters' tags attached.
b. Samples of rubber and cambric insulated, braided wire and cables one foot long, two of each size to be used, with manufacturer's and underwriters' tags attached.
c. One sample two feet long of lead-covered cable, specified for service mains.
d. Sample of complete outlet box with fixture stud attached.
e. Samples of switch and wall receptacle boxes.
f. Samples of single pole switch mechanism and flush plate.
g. Sample of wall receptacle with plate and attachment plug.
h. Sample of floor outlet box complete with receptacle, attachment plug, brass nozzle and cover.
i. Sample fuses with ferrule and knife blade contacts, two sizes of each style, as required.
j. A section of panel board, mounting two opposite knife switches with fuses and section of buses.
k. A one hundred (100) ampere unmounted switch of type to be used on switchboards, complete with fuse studs.

No work involving any sample shall proceed until the written approval of the sample is obtained from the State Department of Engineering.

Samples will be retained by the Department for purposes of comparison. Samples taken during progress of work shall be identical with samples submitted.

(474) Working Drawings: Within thirty (30) days after the award of the contract, this Contractor shall submit to the State Department of Engineering for approval the following drawings, prepared by him in accordance with the plans and specifications. All drawings shall be submitted in triplicate in the form of blue prints on a scale of three (3) inches to one (1) foot, completely dimensioned, giving front and side elevations, together with such sections as required to clearly show construction.

(a) Switchboard Drawings:
Main Switchboard;
Water Pump Control Panel;
Boiler Room Switchboard;

(b) Panels and Cabinets:
Typical panel with schedule for all panels giving size of panel, size of cabinet, number of branches and size of buses.
Typical surface type telephone and lighting cabinets.
Typical flush type telephone and lighting cabinets, showing method of attachment of trim and doors.

(c) Junction and pull-boxes for each condition, with complete description and location.

(d) Drawings showing location and method of installation of outlets over skylight and back of cornice in Supreme Court Room.

(475) Conduits: An accessible wrought iron pipe conduit system shall be installed for all electric lighting and power wiring and for telephone and signal systems, as specified. Service cables shall be installed in fibre conduit.

All iron pipe conduit shall be new, standard weight steel pipe, galvanized both inside and out and finished inside with a smooth, uniform coat of flexible enamel. Enamel and galvanizing shall not crack or break off and shall present a smooth surface when the conduit is bent to a radius of three and one-half (3½) inches.

All conduit shall pass the test for galvanizing as hereinafter specified. Test samples, after enamel and any other protective coatings over the galvanizing have been removed, shall be first cleaned with carbona, benzine, or turpentine and cotton waste (not with a brush), and then thoroughly rinsed in clean water and wiped dry with clean cotton waste. The sample shall then be immersed in a standard solution of copper sulphate for one minute and then immediately removed, washed in water and thoroughly wiped dry. This process shall be repeated four times, and if, after the fourth immersion, there is a copper-colored deposit on the sample, or the zinc is removed, the lot from which the sample was taken shall be rejected. Only one set of samples of any one manufacture will be tested.

The standard solution of copper sulphate shall consist of commercial copper sulphate crystals, dissolved in distilled water. The solution shall be neutralized by the addition of an excess of chemically pure cupric oxide (CuO), then filtered and shall have a specific gravity of 1.186 at 65 degrees Fahrenheit. The temperature of the solution during the test shall be maintained between 62 and 68 degrees Fahrenheit.

The conduit for the main service feeders from the service cabinet to the main switchboard shall be Orangeburg fibre conduit, or equal, with walls not less than one-quarter (¼) inch in thickness and joints of the socket type.

(476) Installation of Conduit: All conduit shall be of the sizes shown and, except where otherwise provided for, shall be run concealed in the walls, partitions or floors of the building and shall be built in during construction.

Locations of conduits as shown on the plans are diagramatic and the locations chosen by the Contractor shall be subject to the approval of the State Department of Engineering before the work is installed.

Horizontal runs of one-half (½) and three-quarter (¾) inch conduit may be run in the floor slabs as directed, but larger sizes shall be run between the furred ceilings and the floor structure above. Conduits may be run exposed in the attic and in the unfinished portions of the basement, but shall be run parallel or at right angles to the floor beams in a neat manner.

All conduits, not imbedded in concrete, must be rigidly secured in position without sagging, by means of pipe clamps or metal cleats, which shall meet the approval of the Department of Engineering. Conduits larger than three-quarter (¾) inch in diameter shall not be supported on the ceiling construction. Where the proper supports cannot be obtained otherwise, this Contractor shall furnish and set in the concrete, iron hangers for the proper support of the conduit. Wooden

plugs set in the concrete or wooden supports of any kind shall not be used. Where a number of exposed conduits run in the same direction they shall be run parallel and where a change in direction is made, the same center shall be used for the radii of all the bends.

All conduit shall be installed so as to maintain a clearance of not less than twelve (12) inches between the conduit and any steam or hot water pipe. Where crossings are necessary the space shall be as great as construction will permit.

All bends and offsets shall be of as large a radius as the construction will permit and in no case shall the radius be less than three and one-half (3½) inches.

In making joints, conduit shall be accurately cut and threaded and smoothly reamed. Joints shall be securely made up with red lead and shall be watertight. No running threads shall be used. Where such a device is necessary, right and left, or Erickson couplings shall be used. All conduits shall be kept corked during construction, using Wolf conduit plugs, and should moisture or foreign matter collect in any conduit, same shall be cleaned out to the satisfaction of the State Department of Engineering.

Vertical runs of conduit shall be supported at each floor level by pipe clamps or other approved supports.

All conduits shall be secured in place where they enter panel boxes, pull and outlet boxes by galvanized locknuts on conduit inside and outside of box. A galvanized bushing shall be provided on the end of each conduit.

Empty runs of conduit of the sizes indicated shall be installed as shown or specified herein for telephone and signal wires.

The necessary chases and sleeves shall be provided where conduit passes through floors or walls and cannot be installed during construction. No cutting will be allowed except as directed by the State Department of Engineering.

All iron conduit run below the basement floor shall be given two (2) coats of asphaltum paint before installation.

All systems of conduit shall be permanently and effectually grounded. Care shall be taken to obtain good contact at all panel boxes, pull boxes and outlet boxes. Where good contacts cannot be obtained, the conduits shall be bonded around the boxes with a copper strip equivalent to a No. 2 gauge wire.

The conduit for the service cables shall consist of three and one-half (3½) inch fibre ducts laid in concrete under the basement floor and shall be installed as follows, with as few bends as possible: A layer of concrete five (5) inches thick shall be laid in the bottom of the trench. Conduit shall then be laid on this, spaced five and one-half (5½) inches on centers and the spaces between filled with concrete. The ducts shall then be covered with concrete up to the level of the bottom of the floor slab. Conduit shall be laid at a depth to allow at least four (4) inches of concrete between the top of the conduit and the bottom of the floor slab.

All concrete shall be mixed in the proportion of one (1) part cement, two (2) parts sand and four (4) parts of three-quarter (¾) inch crushed rock.

Joints in the fibre conduit shall be of the socket type, made up with hot asphaltum. Standard bends shall be used at each end to rise through the basement floor.

These conduits shall be installed as shown, terminating in the pull box at the bottom of the main switchboard.

(477) Wire and Cables: All wires and cables used in this contract shall be Simplex, Habirshaw, Parac, General Electric Company's, or equal and approved make. Conductors shall be copper, thoroughly tinned and of not less than ninety-eight (98) per cent conductivity. All conductors No. 8 B and S gauge and larger shall be stranded.

All wires and cables shall bear the Underwriters' Laboratories' label; shall be brought to the job in unbroken packages and approved by the State Department of Engineering, before the same are installed.

All wires and cables except service cables shall be single or double braided, insulated for six hundred (600) volts, rubber covered, except sizes one-naught and larger, which shall be cambric insulated.

Service cables shall be 600 volts, cambric insulated, lead covered, with a double-braided, cambric-insulated lighting neutral.

(478) Installation of Wires and Cables: Wires and cables shall be of the sizes indicated on the drawings and shall not be drawn into the conduit until all work of any nature that may cause injury to them has been completed. The neutral conductor of all three-wire circuits shall be of the same size and insulation as the other wires of the circuit.

Care shall be used in pulling in the wires, that no damage occurs to the wire or insulation. Powdered soapstone will be the only lubricant permitted.

All conductors run vertically shall be supported in an approved manner by porcelain clamps which will carry the weight of the conductors.

All branch circuits at all outlets and all feeders and mains in pull boxes and in gutters of panels shall be marked with linen tags, wired on. On these tags shall be marked in ink the number of the circuit or feeder. At fixture locations additional tags shall be attached as a guide in connecting the fixtures.

Ample spare wire shall be left at all outlets and terminals for the connection of fixtures, motors and control apparatus.

(479) Location of Outlets: The locations of the outlets, as shown on the plans, are as accurate as is possible to determine at this time. Minor changes on account of architectural conditions, furniture or other reasons shall be made without extra charge. The exact location of all outlets and termination of feeders to motors shall be taken up with the State Department of Engineering and located accordingly. This Contractor will be held responsible for the accurate location of all outlets with respect to the finished work of other contractors.

(480) Wall and Ceiling Outlets: A one-piece galvanized steel outlet box, complete with cover, shall be installed at each outlet except as otherwise specified. Galvanizing shall stand the same tests as specified above for conduit. Boxes shall be of the shape best suited to the location and shall be of sufficient size to contain all wires and connections

without crowding, but in no case less than four (4) inches square or four (4) inches in diameter.

All outlet boxes shall be securely fastened in position. Those in furred construction shall be bolted to three-quarter (¾) inch channels long enough to span two furring channels, to which they shall be wired. Boxes, when set in concrete, shall be secured to the forms to prevent displacement during construction.

Boxes at ceiling outlets in the entrance vestibule shall have fixture hangers of five-eighths (⅝) inch round iron, threaded with standard thread and securely anchored in the floor slab above. All other ceiling outlets and wall outlets in main lobby shall be fitted with three-eighths (⅜) inch malleable iron fixture studs, secured to the box with bolts.

Outlet boxes shall be so set that covers will be flush with the finished plaster and the fixture studs will stand at right angles thereto.

Boxes for switch outlets shall be set four (4) feet, six (6) inches from finished floor to center of switch, except as otherwise directed by the State Department of Engineering.

Boxes for receptacles shall be set in baseboard as directed, except as otherwise specified.

Sample outlet boxes of each type used shall be submitted to the State Department of Engineering for approval.

(481) Floor Outlets: Floor outlets shall be made with galvanized, cast iron, non-adjustable, watertight floor boxes, Sprague No. 6860, or equal, as listed on page 323 of Pacific States Electric Company's catalog. Boxes shall be securely anchored in the concrete and shall be set level, with top of floor flange flush with surface of linoleum. All boxes shall be closed with flush plates and the attachment plugs and brass nozzles shall be delivered to the State Department of Engineering.

(482) Motor and Control Outlets: Motors will be furnished with terminals for the attachment of conduit. In each case the rigid conduit shall carry the wires to a point close to the motor terminals and the actual connection to the motor shall be made with flexible conduit in an approved manner. Other contractors will be responsible for the connection of the motors to the circuits and for their satisfactory operation.

In every case, where conduit does not terminate in a wiring compartment and no terminal fittings are specified, this Contractor shall furnish and install Crouse-Hinds or equal condulets, of the proper size and type to meet the approval of the State Department of Engineering.

(483) Pull and Junction Boxes: Where indicated or required to facilitate pulling, connection or support of cables, pull or junction boxes shall be furnished and installed. For conduits larger than three-quarter (¾) inch and for all risers special sheet metal boxes shall be used. Each box shall be designed to suit conditions and shall be built according to drawings prepared by the Contractor and submitted to the State Department of Engineering for approval. All boxes shall be securely anchored to the building construction in an approved manner.

(484) Panel Boards: This Contractor shall furnish and install in metal cabinets, where indicated on the drawings, panel boards of dull black, marine finished, oiled slate, one (1) inch thick. Panels shall be

free from metallic veins and other defects and constructed in accordance with the detailed drawings.

All buses, switches and fuses shall be installed on the front of the panels, as shown on the drawings. Bus-bars shall not be less than one-half (½) inch wide and one-eighth (⅛) inch thick. Each branch circuit shall be equipped with a double pole, thirty (30) ampere knife switch with National Electric Code cartridge fuses connected so that the switch disconnects the fuses from the buses. Switches shall be of approved make, with composition spool type handles. Blades shall be at least one-sixteenth (1/16) of an inch in thickness and shall be secured to hinge posts with hollow rivets spun over on spring washers. Cross bars shall be copper, not less than one-half (½) inch wide and five thirty-seconds (5/32) inch thick, with switch jaw posts sweated and pinned into them. Separate wire clamping clips shall be provided for all fuse terminals. Suitable lugs shall be provided for the connection of the feeders to the buses. All screws used to secure the various parts to the slate base shall be heavily copper plated. Switches and buses shall have a draw-file finish, heavily lacquered.

Each circuit and feeder on all panel boards shall be numbered opposite the switch on the nearest bus bar, with engraved or recessed numbers filled with black enamel.

A neat schedule, printed on heavy white cardboard, showing numbers of the circuits, the rooms containing the outlets controlled and the proper size fuse to be used, shall be furnished. Schedules shall be mounted under glass with suitable copper frame on the inside of the cabinet door.

Contractor shall furnish and install in each panel board cabinet, where shown, a prong key socket and receptacle, General Electric Company's, or equal, for testing fuses. Receptacle shall be connected through an independent branch circuit switch on the panel board.

Typical drawings show the general arrangement of the various panels. This Contractor shall submit detail drawings of a typical panel, on a scale of three (3) inches to the foot, for the approval of the State Department of Engineering. Drawings shall be completely dimensioned, showing details of construction and name of manufacturer. A schedule, giving complete dimensions and specifications for all panels, shall also be submitted for approval before construction is commenced.

Branch circuits shall be so connected to panel boards that the current on each three-wire feeder will be balanced within ten (10) per cent, with all load on.

(485) Panel Board Cabinets: Each panel board shall be installed in a suitable galvanized iron cabinet, furnished and set by this Contractor. Cabinets shall be constructed of galvanized iron of code thickness and rigidly anchored in place in an approved manner. Cabinets located in closets shall have metal trim and door. Door shall be fitted with heavy brass hinges and an approved cylinder lock with spring catch and knob. Trim shall cover the wiring gutter and lining. Door openings shall be the size of the panel. Locks shall all be the same and six (6) keys shall be delivered to the State Department of Engineering.

Cabinet in Boiler Room shall be set flush with the finished wall and shall be arranged for the attachment of door and trim, which will be furnished and installed by another contractor.

Cabinets shall be designed for a wiring gutter back of the lining at least three (3) inches wide on all sides. Where large conductors are used, this width shall be increased to allow ample space. Linings shall be marine finished, oiled slate, one-half (½) inch thick and held in position by adjustable corner irons, placed in wiring gutters with only the screw head projecting into the panel space. Linings shall fit the panel surface closely and shall be slotted for the passage of wires.

Detailed drawings showing construction of surface and flush type cabinets shall be submitted for approval of the State Department of Engineering before they are built.

(486) Main Switchboard: This Contractor shall furnish, erect and connect up complete in the Boiler Room, where shown on the drawings, a main switchboard of dull black, marine finished, oiled slate, one and one-half (1½) inches thick, with beveled edges.

Panels shall be seventy-two (72) inches high, with an eighteen (18) inch sub-base. Panels shall be securely fastened to a japanned angle iron frame, using one-half (½) inch bolts with polished copper acorn nuts and washers on the face of the board and rubber cushions between the board and frame.

Frame of main switchboard shall be constructed of two (2) by one and one-half (1½) by three-eighths (⅜) inch angles placed vertically behind each joint. Horizontal angles one and one-quarter (1¼) by one and one-quarter (1¼) inches shall be placed horizontally at the top and bottom of the board, as shown. Frame shall be bolted to a four (4) inch channel iron set in floor and thoroughly anchored when the floor is poured. Top of angles shall be securely anchored to the first floor slab. Space between top of board and floor above shall be closed with No. 12 U. S. gauge sheet steel.

Pull boxes made of galvanized iron of code thickness, not less than nine (9) by nine (9) inches in cross section, shall be installed behind the switchboard at the top and bottom, as shown on the drawings. Boxes shall run the full length of the board and shall be securely fastened to the switchboard frame. The rear side of each box shall be hinged in sections and fitted with vault handles and an approved catch. Partitions shall be provided in the pull boxes between the power and lighting sections. Porcelain bushed holes in the bottom of the upper box and in the top of the lower box shall be provided so that conductors leave the box directly opposite their respective switches. The wires entering each conduit shall be properly cabled together in the pull boxes, various groups being kept separate and all unnecessary crossings avoided.

Arrangement of panels shall be as shown on the drawings and called for in the schedules. Switchboard shall be divided into separate sections for lighting and power.

All bus-bars and connections shall be made of flat copper of ninety-eight (98) per cent conductivity, mounted on rear of board and of the size to limit the current density to one thousand (1,000) amperes per square inch, based on the total capacity of the fuses which are con-

nected to them. No bars thicker than one-quarter (¼) inch or thinner than one-eighth (⅛) inch shall be used. Three-wire buses shall be provided for the lighting section and two-wire for the power. Buses and leads shall be installed in a systematic manner and arranged to produce an open and accessible arrangement. Heavy pressed copper lugs shall be provided for all cable connections.

Cables between pull boxes and switch studs shall be grouped together where the arrangement permits. All single cables and groups of cables shall be covered with a layer of friction and a layer of asbestos tape, Johns-Manville or equal. Cables shall then be given two coats of black, air-drying varnish, Ajax or equal.

Switches shall be of the high fingered type, with extended studs where connected to the bus-bars. Hinge posts and jaws shall be built of a solid copper block, slotted to receive the clips. Clips shall be hard drawn copper, sweated and pinned in place and on capacities of one hundred (100) amperes and larger shall be slotted to provide for automatic adjustment. Blades shall be held in clips by means of brass bolts clamped on spring washers by positively locked nuts. Cross bars shall be fibre, slotted to receive blades. Handles shall be kiln dried hardwood, black enameled. All switches and buses shall have a draw-file finish, heavily lacquered.

Switches controlling public lights and the feeder to elevators shall be provided with approved retaining latches to prevent the opening of the switch except by authorized persons. Each switch shall be provided with a neat fibre plate on which shall be stamped the circuit controlled and size of fuse to be used. One-quarter (¼) inch block letters filled in with white shall be used.

This Contractor shall leave space for a lighting and a power watt-meter as indicated. He shall obtain from the power companies who are in a position to supply this building, the size and type of meters which would be used, and shall provide and connect to the bus bars polished copper meter studs, Demco or equal.

Switchboard receptacles, General Electric Catalog No. G. E. 550, or equal, shall be installed on service panels as shown and connected to the bus-bars through the switches provided.

For testing of lighting meter, provide current coil calibrating terminals, General Electric Catalog No. 174434, complete with Catalog No. 174435 links, or equal and approved combination.

This Contractor shall submit detailed drawings of the proposed switchboard on a scale of one and one-half (1½) inches to one (1) foot, completely dimensioned. Drawings shall be front and end elevations and sufficient sections to show clearly pull boxes and all buses. These drawings shall be submitted in triplicate and approved by the State Department of Engineering before work is started on switchboard. Switchboard drawings shall be submitted to each of the power companies which could supply the building, and their approval of the service panels obtained in writing and transmitted to the State Department of Engineering.

Back of switchboard shall be enclosed with an iron grille six (6) feet high, located as shown and constructed of No. 9 B. W. G. iron wire laid in one and one-half (1½) inch diamond mesh and held in one (1) inch channel iron frames. Each end of enclosure shall be provided

with a grille door two (2) feet, six (6) inches wide by six (6) feet high. Each door shall be fitted with strong brass hinges and an approved spring lock with two keys.

Front of board shall be enclosed with a one and one-quarter (1¼) inch iron pipe railing fitted with a gate as shown. Railing shall be thirty (30) inches high and thoroughly anchored to the floor.

Railing, grille, switchboard frame, outside of pull box and all exposed conduit and iron work installed by this Contractor shall be painted as specified under Painting.

A wooden floor mat thirty (30) inches wide extending the full length of the switchboard shall be provided. Mat shall be one (1) inch thick, with openings one (1) inch square, and shall be constructed of clear spruce in an approved manner. Mat shall be given two coats of good varnish.

(487) Power Switchboards: The power switchboards shall be furnished and installed where shown, complete as specified.

The switchboard located in Boiler Pit shall consist of two panels sixty (60) inches high, arranged as shown and constructed as specified for the main switchboard. Frame of board shall be one and one-half (1½) by one and one-half (1½) inch angles, braced to the wall and anchored to channel iron imbedded in the floor. Grille shall be provided from each end of board to wall with suitable door at one end, as specified for main switchboard. Furnish and install a one and one-quarter (1¼) inch pipe railing in front of board as shown.

The Heating Contractor will furnish the following equipment, which shall be installed by this Contractor in accordance with the drawings:

1 clock
5 gauges
5 pneumatic valve controls
1 air compressor control switch
1 oil pump protective switch
1 switch and control for vacuum pump.

A pilot lamp bracket shall be installed over the gauges as shown. Bracket shall be of approved design, with porcelain half shade and keyless socket, and shall be connected through switch provided.

A suitable sheet iron pull box of code thickness shall be installed back of switch panel, to facilitate the connection of the various circuits.

Under each switch or other piece of apparatus on the board this Contractor shall provide fibre plates as specified for main switchboard.

The switchboard for the control of the water pumps shall consist of a single panel of marine finished, oiled slate one and one-quarter (1¼) inches thick, on which shall be mounted the contactors for starting the two water pumps and two sixty-ampere, single pole knife switches to short circuit the float switches, for manual control of the water pumps. The Plumbing Contractor will furnish the contactors to this Contractor, who shall install same on the panel and connect up complete.

Front of panel shall be enclosed by an approved protective wire screen, which shall be securely attached to the board and provided with Yale lock and two keys.

Conduits shall be brought behind panel and terminated in suitable condulets.

(488) Feeders and Circuits: Feeders and circuits shall be installed as shown on the drawings and in accordance with the feeder and circuit schedules. All vertical runs shall be supported in an approved manner as required by the National Electric Code.

(489) Service Mains: The power and lighting service mains shall be of the sizes shown on the drawings and shall be installed in the fibre conduits under the basement floor as indicated. The ends of the lead-covered cables shall be sealed with an approved waterproof pothead.

(490) Service Grounds: A ground wire of No. 4 B. S. gauge rubber-covered wire shall be run in conduit as shown from the switchboard to the four (4) inch water main in the basement and attached thereto with an approved ground clamp. Ground wire shall be connected with the neutral of the lighting service.

A second ground wire shall be installed as specified above and shall be connected to the lead sheaths of service cables.

(491) Fuses: All switchboards and panel boards shall be completely equipped with fuses of proper size as called for in the schedules. All fuses shall be National Electric Code standard enclosed fuses and shall be General Electric, Bryant and Perkins, D. and W., or equal and approved. All fuses blown in testing or operation before final acceptance of the completed installation shall be replaced by the Contractor at his expense. Extra fuses to the amount of twenty-five (25) per cent of the complete equipment shall also be furnished.

Fuses with ferrule and knife blade contacts shall be submitted to the State Department of Engineering for testing, two sizes of each type as directed.

This Contractor shall construct and install in the Boiler Room, where directed, a neat wooden fuse cabinet finished as directed. Cabinet shall have a compartment for each size fuse of ample size to contain all the spare fuses. Doors of cabinet shall be fitted with brass butts and Yale mortise locks with two keys each.

(492) Wall Switches: All wall switches shall be of the flush, push button type, General Electric, Perkins, or equal and approved, of not less than ten (10) amperes capacity. Flush plates shall be struck-up, brass, finished to match the adjacent hardware. Switches shall be single pole, double pole or three-way as indicated, and where two or more are shown at the same location, gang plates shall be used.

A single pole switch mechanism and flush plate shall be submitted to the State Department of Engineering for approval.

(493) Wall Receptacles: All receptacles unless otherwise specified shall be General Electric flush receptacles Cat. No. G. E. 658 and G. E. 694, or equal, of not less than ten (10) amperes capacity. Receptacles shall be single or double outlet as indicated. All receptacles, unless otherwise directed, shall be located in baseboard at a uniform height above the floor. Flush plates shall be struck-up brass finished to match the surrounding hardware.

Attachment plugs shall be General Electric Catalog No. G. E. 625 or equal. Contractor shall deliver to the State Department of Engineering attachment plugs for seventy-five (75) per cent of the receptacle outlets.

For each vault, Contractor shall furnish a cable connector of sufficient length to connect the receptacles when vault door is open. Cable shall be No. 16 duplex silk-covered, reinforced, flexible cord fitted at each end with an attachment plug.

(494) Court Room Outlets: For illumination of the Supreme Court Room, outlets shall be provided above the ceiling light and back of the cornice as shown.

Outlets over ceiling light shall be supported on channel irons provided by another contractor and shall be located to give a uniform illumination over the glass below. Thirteen one hundred (100) watt units shall be provided, each consisting of a one hundred (100) watt Mazda lamp with an Ivanhoe B A E-100 reflector and No. 822 holder, or equal and approved combination.

To illuminate main ceiling, Contractor shall provide thirty-six (36) one hundred (100) watt outlets back of cornice as indicated. Each outlet shall be fitted with a Catalog No. 8198 E-65 X-Ray reflector unit, complete with a one hundred (100) watt Mazda lamp, or equal and approved combination.

Back of cornice under the arched ceiling, fourteen (14) sixty (60) watt outlets shall be provided as shown. Each outlet shall be equipped with a Catalog No. 8197 E-65 X-Ray reflector, complete with a sixty (60) watt Mazda lamp, or equal and approved combination.

Contractor shall submit, for the approval of the State Department of Engineering, drawings showing in detail the method of installation for all outlets in the Court Room.

A circuit of two No. 12 wires shall be run from the fifth floor panel board to a point above ceiling of the Court Room vestibule. This circuit shall be terminated in an outlet box located as directed.

Lamps will be furnished to the Contractor by the State Department of Engineering and he shall install same and adjust lighting units to obtain the best possible distribution of light.

All outlets in Court Room shall be controlled by a 50-ampere remote control switch, Diamond H Type F-1, or equal, for operation on either direct or alternating current. Switch shall be installed on the feeder as shown and shall be operated by a momentary contact switch located on the fourth floor as indicated.

(495) Water Pumps: The water pumps will be automatically started and stopped by float switches operated by water levels in the tanks in the attic. This Contractor shall install the control wires as shown and install and connect up the float switches and counter e. m. f. self-starters, which will be furnished by the Plumbing Contractor. Float switches shall be supported on the building construction or tanks in an approved manner.

(496) Elevators: Elevators will be furnished and installed complete by another contractor. This Contractor shall run the feeders to the elevator control panels as indicated, terminating in suitable con-

dulets where directed. Connections will be made by Elevator Contractor.

Outlets shall be provided in elevator shafts as indicated for the lighting of elevator cages. Outlets shall be made with suitable outlet boxes and covers as approved by the State Department of Engineering. Location of these outlets shall be as required by the Elevator Contractor.

(497) Ventilating Fans: Ventilation equipment including motors will be furnished by another contractor. Fans in attic and toilet rooms shall be controlled by a single pole, push-button switch, with indicating lamp, Bryant Catalog No. 427, or equal, located as shown. A thirty-ampere, double-pole, externally operated, fusible knife switch shall be provided at the fan to disconnect the motor from the circuit. The exhaust fans in fifth floor ceiling shall be controlled together by a single-pole push-button switch, with indicating lamp, as specified above, located on the fourth floor as shown. For the ventilating fan on the fourth floor, the Heating Contractor will furnish an externally operated line switch and an enclosed motor-starting rheostat. This Contractor shall install and connect up this equipment complete as directed. The fan in the Boiler Room shall be controlled by a switch on the main switchboard as indicated.

(498) Boiler Room Auxiliaries: This Contractor shall furnish and install circuits as required to control all Boiler Room motors as follows:

1 oil pump
1 air compressor
1 vacuum pump

Conduit shall be placed during construction of the floor and shall be brought to the location as given by the Heating Contractor. Connections to motor terminals shall be made with flexible conduit as specified above.

(499) Vacuum Cleaner: The circuit for the vacuum cleaner shall be run as shown and terminated with a condulet as directed.

(500) Telephone System: This Contractor shall furnish and install a complete system of conduit, sheet metal cabinets and telephone outlet boxes for a private branch exchange system, as called for on the plans and hereinafter specified. All work shall be in accordance with approved methods and shall be subject to the approval of the Division Plant Engineer of the Pacific Telephone and Telegraph Company, both during construction and when completed. This Contractor shall obtain from the Telephone Company and deliver to the State Department of Engineering a written acceptance of the entire installation.

All conduit shall conform to the above specifications for light and power work as to quality and method of installation. Bends in conduit shall be of minimum number and shall be of sufficient radius to facilitate the installation of the wires or cables. Care shall be taken to keep the inside of conduits free from grease or oil. A No. 14 iron fish wire shall be left in all conduit runs to facilitate the installation of wires and cables.

Where telephone outlets are shown on the plans a four (4) inch square outlet box with an approved bushed cover shall be installed.

In each location indicated, sheet iron telephone cabinets of the same weight and quality as provided for lighting and power cabinets shall be installed. Cabinets shall be without doors and those for installation in walls shall be arranged for the attachment of door and trim, which will be furnished and installed by another contractor. Doors will be full size of cabinet. Cabinets shall be rigidly fastened in place in an approved manner.

Service conduit under basement floor shall be connected with the conduit of the Telephone Company at the sidewalk line. Conduits shall be run from cabinets to the switchboard locations on the fourth and fifth floors as indicated.

Between wire moulds in adjacent rooms and between wire moulds in each room and the corridor this Contractor shall install three-quarter (¾) inch conduit nipples thoroughly reamed at each end. Conduit cross-overs shall be installed as shown, terminating at each end in the wire mould. Each cabinet shall be connected with conduit to the wire mould, through a special sheet iron box placed back of mould, as shown.

All wires, cables and other telephone equipment will be furnished and installed by the Telephone Company.

(501) Telegraph and Fire Alarm System: For telegraph and fire alarm system, this Contractor shall install a conduit riser in each wing and at the elevators as shown. At each floor, where directed, a four (4) inch galvanized square box with a blank cover shall be installed. Boxes shall be connected to the wire mould as indicated.

Lighting Fixtures

Note—Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(502) Scope of Work: The Contractor for this work shall furnish all labor, apparatus and material required to complete the installation in every detail of the electric lighting fixtures, all as herein specified and as required by the electric wiring plans and diagrams accompanying these specifications and the architectural drawings. This Contractor shall install all lamps, which will be furnished by the State Department of Engineering.

It is further understood and agreed that all schedules are approximate only with reference to the number and design of fixtures, and this Contractor shall check same with plans, as he will be held responsible for the complete equipment of all outlets in accordance with the plans and specifications.

The plans and specifications are intended to mutually explain each other, and anything shown on the drawings and not mentioned or referred to in the specifications, or which is referred to in the specifications and not shown on the drawings, shall be considered as shown and specified and shall be performed accordingly without extra charge. In case these plans and specifications are deficient, or not clearly understood, the bidder shall apply to the State Department of Engineering for the required information before such bids are submitted. These plans and specifications shall be fulfilled in the true spirit and intent and any appliance or material essential to the proper construction and installation of the fixtures shall be supplied, even though not specially called for.

All lamps will be furnished to this Contractor at the building by the State Department of Engineering, but he shall install them as directed.

(503) Drawings: Architectural drawings shall be consulted, together with the electrical drawings, to eliminate possible errors.

(504) Unit Prices: Each bidder shall submit with his bid a schedule giving the prices of fixtures and labor as specified below. Prices shall cover cost of fixtures installed and connected up complete, as an addition or deduction from the work as described in these specifications and shown on the accompanying drawings. Bids which do not include this schedule will not be considered:

a. Price for each fixture design as herein specified.
b. Price per hour for journeyman fixture hanger.
c. Price per hour for labor of fixture hanger's helper.

(505) Rules and Regulations: All work and materials shall be in full accordance with the latest rules of the National Board of Fire Underwriters and the Department of Electricity of the City and County of San Francisco.

This Contractor shall obtain all necessary permits and certificates of inspection and shall pay all fees and charges connected therewith. Upon completion of the work he shall deliver to the State Department of Engineering a satisfactory "Certificate of Inspection" from the Department of Electricity of the City of San Francisco and from the Board of Fire Underwriters of the Pacific.

(506) Inspection: All work and material covered by these specifications shall be subject to inspection at any time, by representatives of the State Department of Engineering.

This Contractor shall have all materials and fixtures inspected during construction by a representative of the Department of Engineering, and if built other than locally, he shall pay all expenses of such inspection.

Should any material or workmanship not conform with the specifications and drawings, this Contractor shall, upon order of the State Department of Engineering, immediately remove the rejected work from the premises.

(507) Tests: The State Department of Engineering will make tests of such parts of the work, as they consider necessary, to ascertain if in accordance with the specifications. The Contractor shall extend to the Department all facilities to this end and shall furnish any skilled or unskilled help required.

When the entire installation has been in regular operation for one (1) month in a manner satisfactory to the Department of Engineering, a complete test will be made.

(508) Guarantee: The Contractor shall be responsible for all work done and material used under the plans and specifications and shall repair or replace, as may be necessary, any defective work or material, which may show itself within one year of the date of final completion, if, in the opinion of the State Department of Engineering, said defect is due to imperfections of workmanship or material. This guarantee must be submitted in writing and approved by the State Department of Engineering before the date of final payment.

On failure to comply with the above guarantee within a reasonable length of time after notification is given, the State Department of Engineering shall proceed to have the repairs made at the Contractor's expense.

(509) List of Materials and Substitutions: Within sixty (60) days after the award of the contract, this Contractor must submit to the State Department of Engineering, a complete list, in triplicate, of all materials to be used under this contract, giving, in the case of each item of material to be used, the name of the manufacturer and the trade name or catalog number. Samples in duplicate, tagged with complete description of the same, must be submitted at this time of all materials to be substituted. The State Department of Engineering shall be the sole judge as to the quality of any substitution offered. No work affected by any article shall proceed until same shall have been approved in writing by the State Department of Engineering. In no case will any substitute for materials specified be considered or allowed after this date.

(510) Samples: This Contractor shall submit to the State Department of Engineering at Sacramento, samples as follows:

a. Samples of fixture wire twelve (12) inches long of each color to be used.

b. Sample of reinforced, silk-covered lamp cord, Type P, twelve (12) inches long.

c. Sample of reinforced portable cord, Type P W, twelve (12) inches long.

d. Fixture parts as samples of each finish to be used.

(511) Working Drawings: Before work is commenced, this Contractor shall submit to the State Department of Engineering for approval, a detailed drawing of each fixture prepared in accordance with the plans and specifications. Drawings shall show in detail the construction and wiring of the fixture and the method of attachment to support.

(512) Wiring: Fixtures shall be wired in a neat, approved manner with approved fixture wire, concealed wherever possible. Where wires must be exposed, color shall match finish of fixture and wire shall be placed in an inconspicuous location.

(513) Sockets: All medium screw sockets shall be General Electric Company's "Multi-catch" or equal, keyless, key or pull-chain, as required. Mogul screw sockets shall be General Electric Company's G. E. 139 or equal. Where sockets are exposed in fixtures, finish shall be same as that of fixture.

(514) Finish: Finish of fixtures shall be as shown on the drawings and specified. Metal parts of fixtures shall be finished by the following process:

1. Metal shall be acid cleaned.
2. Electro-plated in copper solution for fifteen (15) minutes.
3. Electro-plated in brass solution for fifteen (15) minutes.
4. Lacquered by dip process and baked.

(515) Fixture Designs: The design of the fixtures shall be as shown and specified. This Contractor shall submit for the approval of the State Department of Engineering complete drawings of each design, showing in detail the ornamentation, finish and construction.

Designs not shown by drawings shall be made up as follows:

Design "L":

Outlets designated thus shall be equipped with Pass & Seymour rosette No. 112, attached with a P. & S. conduit box strap; round reinforced Type P lamp cord; a Benjamin No. 4208 pull-chain socket with shade holder and an Alba No. 3419 shade; or equal combination. Socket shall hang five feet, six inches from the floor. Finish of rosette and socket shall be brushed brass with silk-covered lamp cord to match.

Design "P":

These outlets shall be fitted with Benjamin No. 6C outlet box receptacle, with No. 3624 outlet box cover and No. 1400 outlet box lamp guard, or equal combination.

Design "S":

Outlets marked thus shall be finished with General Electric Company's G. E. 155 conduit box receptacles, or equal.

Design "T":

Outlets of this class shall have Benjamin No. 6047 reflector socket fixture complete with hickey for attachment to fixture stud.

Design "X":

Outlets designated thus shall be fitted with P. & S. No. 112 rosette, P. & S. conduit box strap, reinforced Type P lamp cord, G. E. Multicatch Keyless socket and Hubbell No. 5564 parabola reflector, or equal combination. Socket shall hang five feet, six inches from the floor of boiler pit.

Design "Y":

These outlets shall be equipped with P. & S. No. 112 rosette, P. & S. conduit box strap, reinforced Type PW portable cord and Luxon guard No. 1447, W. E. Cat. 1918, page 431, or equal combination. Guard to hang 3 inches from floor.

(516) Installation of Fixtures: This Contractor shall install the fixtures in the locations shown on the plans and called for in the schedule. Special hangers will be provided for ceiling outlets in Entrance Vestibule. All other ceiling outlets and wall outlets in Main Lobby will be fitted with three-eighths (⅜) inch malleable iron fixture studs.

Fixtures shall be arranged for attachment to the hangers provided and shall be installed in a neat and workmanlike manner and to the entire satisfaction of the State Department of Engineering.

Elevators

Note—Important conditions are contained in paragraphs 1 to 26, which are a part of this specification and which set forth definite limits and allowances in connection with same. Particular attention is called to paragraphs 3 and 13 in regard to bidding on materials, and paragraph 23 in regard to preservation and cleaning.

(517) Scope of Work: The work to be done by this Contractor includes furnishing and erecting two electric passenger elevators, including all elevator machines, motor, controllers, safety devices, car platforms, guides, guide-posts, signal system and all other apparatus, material and work required to make said elevators complete and operative when electric service is supplied. The elevator shafts, pits, pit pans where required, bulkhead, supports for the sheave and machine beams, hatchway enclosures, including the necessary doors and gates for same, wood cars, including their light fixtures, junction boxes at the center of the hatch and the electric wiring to the terminals of the elevator controllers are provided for under other contracts.

(518) Additional Elevator: Each bidder shall submit price with his proposal for one additional elevator to run from first to sixth floor. Same shall be complete as elevators specified herein.

(519) Time Allowance: The Contractor shall begin work as directed in the general conditions preceding these specifications, and assemble on the grounds the materials and apparatus required. The State Department of Engineering will give the Contractor five days' written notice when Contractor shall begin work on the installation, and the Contractor shall complete the work to the satisfaction of the State Department of Engineering in such time as not to delay the other trades or the occupancy of the building.

(520) Contractor's Drawings and Specifications: The Contractor in submitting his bid shall accompany same with detailed proposal, which is to form a part of the contract, and after the contract has been closed he shall prepare all drawings necessary to show the general layout, clearances, positions of overhead sheave and machine beams, location of guides, sheaves, foundations, etc.

(521) Elevators and Speed: One passenger elevator to run from first to sixth floor and one passenger elevator to run from basement to sixth floor.

All passenger elevators to have a speed of 450 feet per minute, with maximum load of 2,600 pounds.

(522) Engines: Passenger elevators to have gearless traction engine of 2 to 1 roping set at top of shaft with the engine, motor electrical release brake, etc., all on same iron bed plate. Motors to be for 220 volts D. C.

(523) Lifting Cables: All passenger elevators to have six lifting or driving cables of mild steel with hemp rope center, consisting of six strands of 19 wires each, made especially for traction elevators.

(524) Sheaves: All sheaves to be of best grade cast iron of as large diameter as can be used, grooved for cables and provided with extra heavy steel shafts. All sheaves located on the cross heads of the cars and counterweights shall be provided with ball bearings.

(525) Guide Posts: Guides for car to be 5 inches by 3½ inches by ⅝ inch planed steel tee sections and weight approximately 16 pounds per foot. Counterweight guides to be 3½ inches by 2 7/16 inches by ⅝ inch, and weight 8 pounds per foot.

All guides to be put together and fastened to place with heavy pattern clamps secured to steel frame. Ends of guides to be double tongue and grooved.

(526) Counter Balance: Counter balance to be by means of cast iron weights in a heavy channel frame.

(527) Cars and Platforms: Car platforms and steel frame to be furnished by this Contractor and to be of suitable strength to take care of loads and so arranged to receive the impact of buffers without injury.

Car enclosures will be furnished by the Carpenter Contractor, and after same are set, this Contractor is to lay floors of 4-inch by 4-inch composition tile ("Linotile" or equal) over platforms. Tile to be set with "Nonpareil" waterproof cement and have all joints tightly sealed with the same cement. All joints shall be true and straight and floors finished perfectly level. Color of tile to be selected by the State Department of Engineering.

(528) Safety Devices: All cars to be equipped with safety brakes, governors, automatic limit switches, safety fuses, automatic speed regulators, gratings, counterweight screens, door contacts, etc.

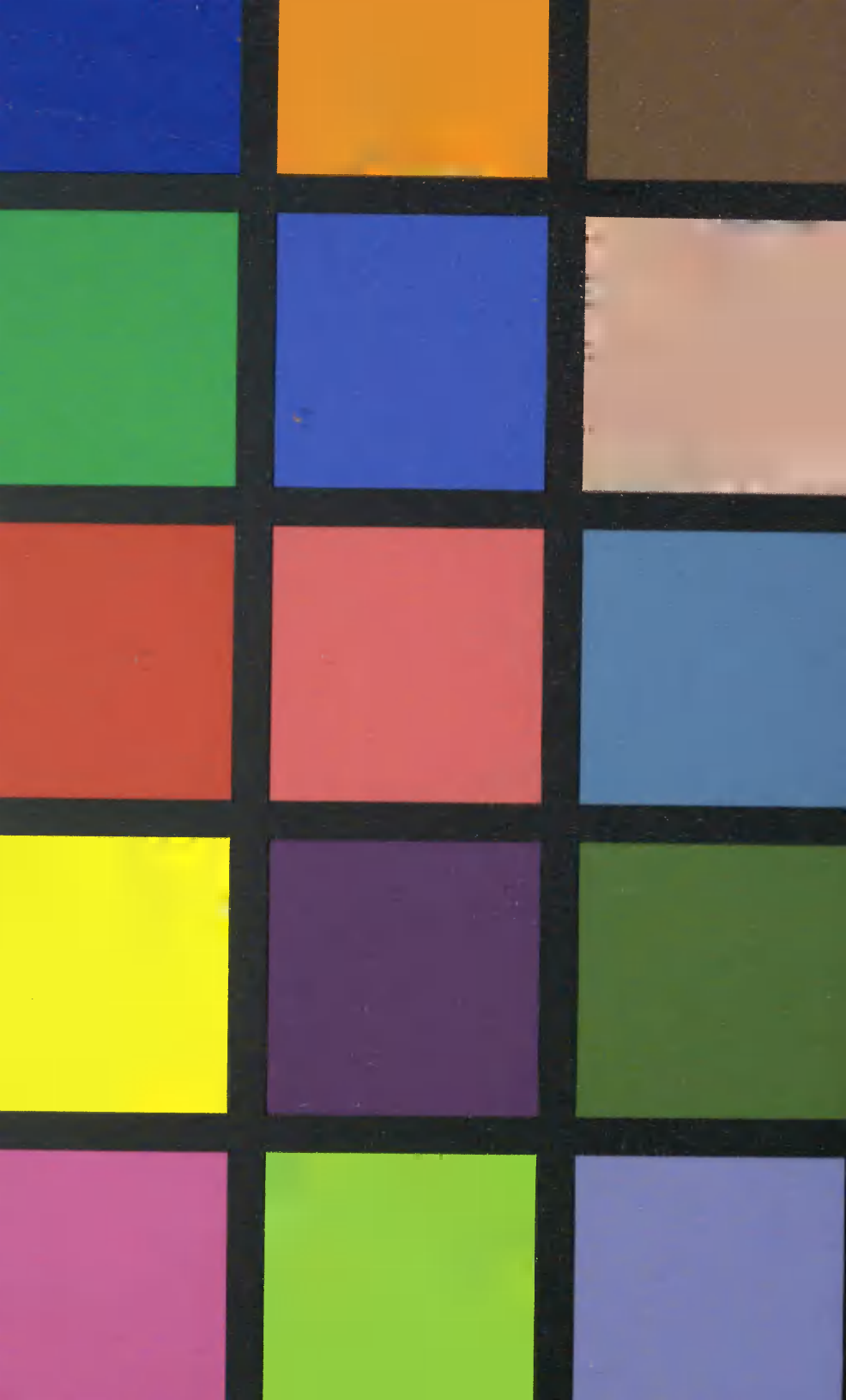
(529) Buffers: All buffers at bottom of shafts to be oil cushion buffers. They must be so arranged as to bring the car to rest without shock or jar from full speed with maximum load.

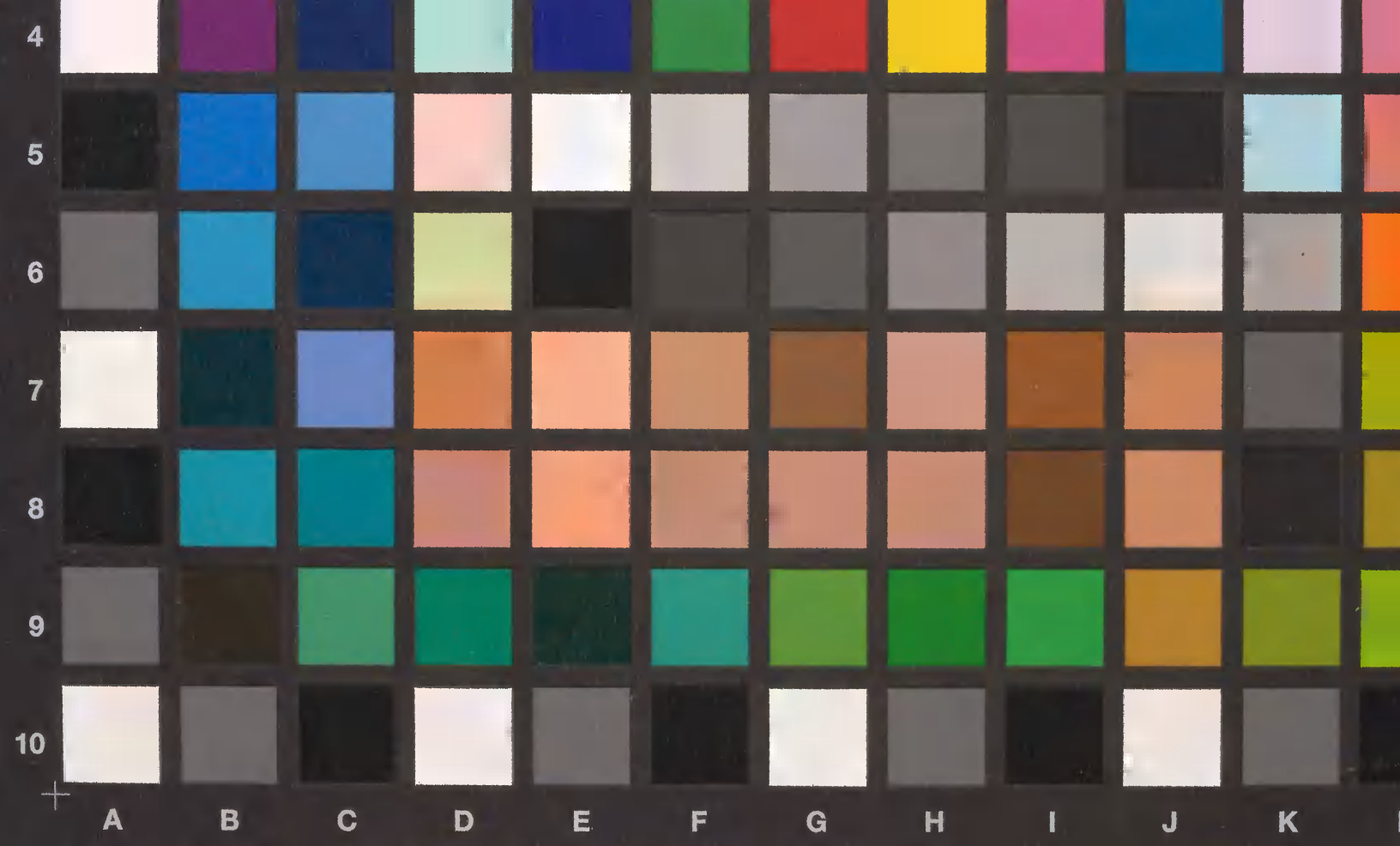
(530) Signal System: Each car to be equipped with a complete flashlight annunciator system, with push buttons for up and down on each floor, except first floor. First floor to have dial over each elevator stating location of each car. Design to be as shown on detail of elevator screens.

(531) Painting: All exposed work and unfinished parts other than machined surfaces furnished under this contract shall be given two coats lead and oil.

(532) Bids: All contractors to submit bids to State Department of Engineering stating the make and kind of elevator, together with list of five buildings in which this type of elevator has been used; he is also to submit detailed specifications.

(533) Tests and Acceptance: Before elevators are finally accepted they must be so installed and equipped with safety devices, etc., that they will pass the tests and inspection of the State Industrial Accident Commission.

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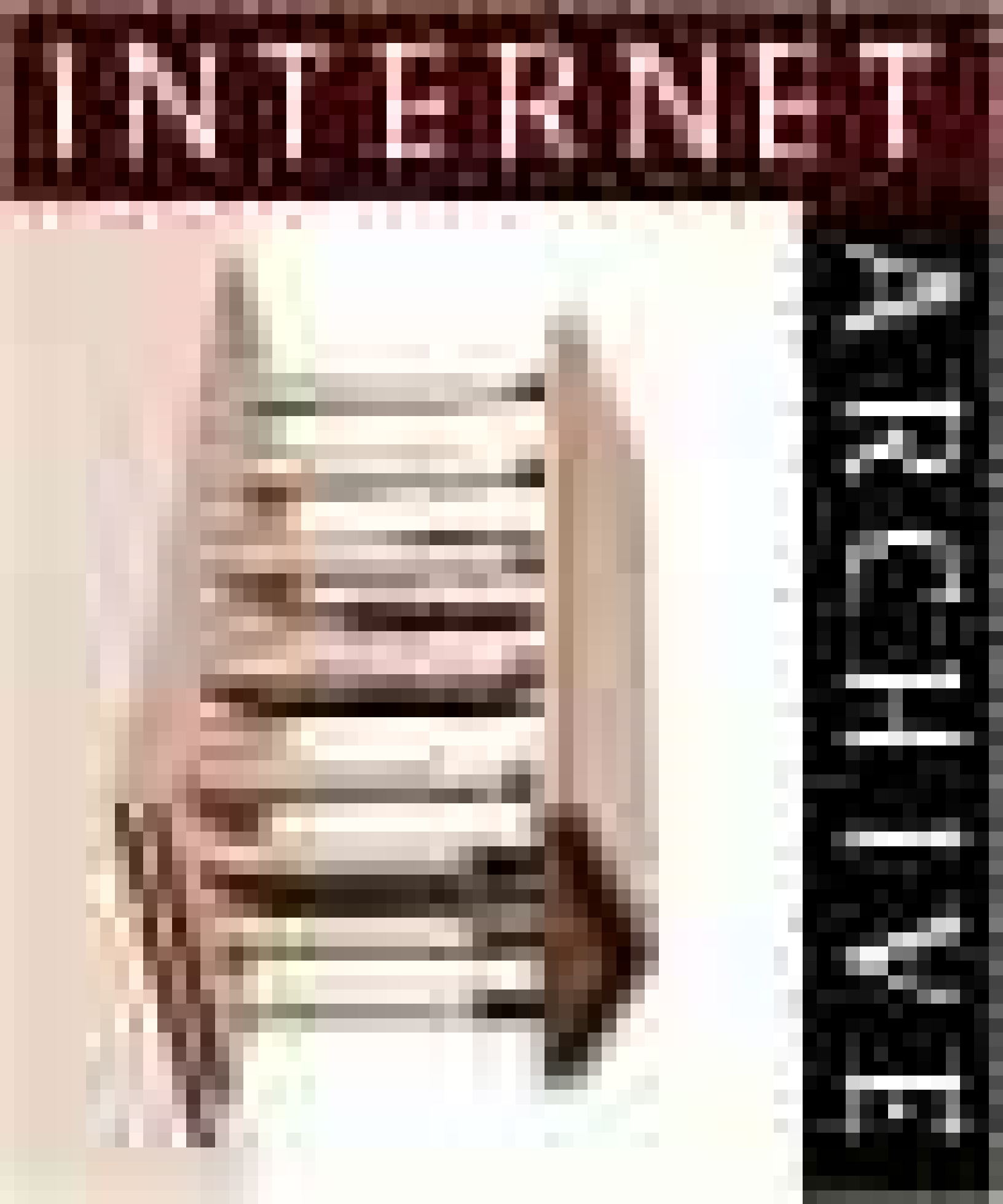
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